

1 **The Roles and Responsibilities of Bus Operators during Bushfires and Floods**

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1 **ABSTRACT**

2 The bushfires that occurred in eastern Australia between 2019 and 2020, along with the dust
3 storms and floods occurring contemporaneously, were of unprecedented intensity and put numerous
4 regional and rural communities in danger and distress. School bus operators in regional and rural Victoria
5 (a state in eastern Australia), displayed a strong sense of community responsibility by protecting their
6 communities during these times. Yet little is known about their roles, responsibilities, and motivations in
7 response to natural disasters. Literature on this subject is scant and what does exist focuses on the
8 accountability of (public) transport coordinators. This paper aims to fill this gap in knowledge. The
9 research team conducted interviews with 31 Victorian bus operators who actively participated in the
10 response to bushfires and floods to gather firsthand experiences and insights. A qualitative approach was
11 adopted to process the interview transcripts and the thematic analysis identified five common themes,
12 addressing bus operators' undertaking in the face of natural disasters and the theoretical construct of sense
13 of community responsibility. Challenges associated with the response to these emergency events were
14 discussed, focusing on communication protocols and coordination within the governance framework.
15 Corresponding recommendations were made for transport stakeholders based on the synthesis of the
16 findings. It is believed that sharing the lessons learnt following recent bushfire and flood events will
17 improve the industry's emergency preparedness and response.

18
19 **Keywords:** bushfires and floods, regional and rural bus operators, roles and responsibilities

20

1 INTRODUCTION

2 Between September 2019 and February 2020, bushfires of unprecedented intensity and
3 devastation engulfed numerous regional and rural communities in eastern Australia. This was
4 compounded by dust storms and floods occurring contemporaneously, which put the communities in great
5 danger and distress and placed significant stress on the nature and scale of resources required to respond
6 to these natural disasters.

7 During these times, school bus operators in regional and rural Victoria (a state in eastern
8 Australia) displayed a strong sense of community responsibility by protecting their communities.
9 However, with little known about their roles, responsibilities, and motivations, the potential for local
10 school bus operators to contribute to the response to natural disasters is far from being realized.

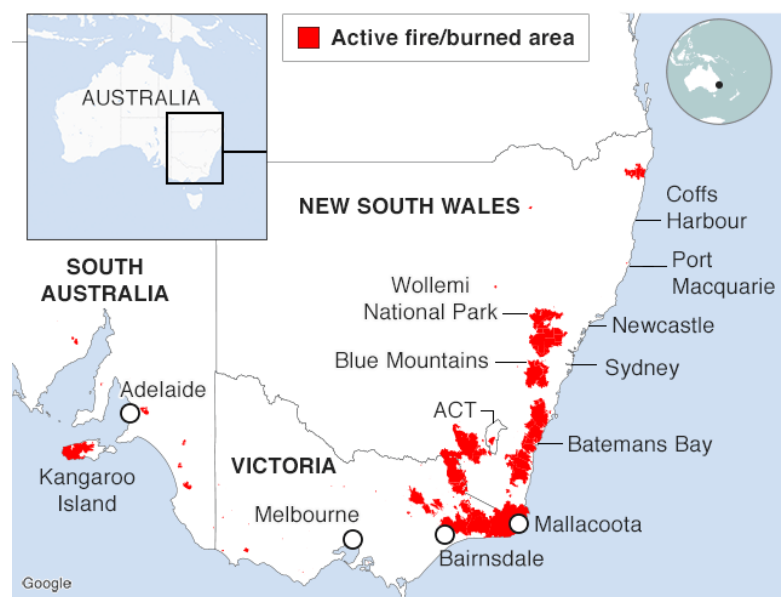
11 This paper aims to address the knowledge gap and is structured as follows. Following the
12 introduction, the context of bushfires and floods in Victoria, Australia, and a review of academic and grey
13 literature regarding the accountability of transport stakeholders in emergency management, are presented.
14 The next section describes the data collection method and analysis approach. The Results Section then
15 illustrates the common themes identified. The paper closes with a discussion of the challenges and the
16 conclusion.

17 CONTEXT

18 Bushfires

19 While bushfires are a natural and inherent part of the Australian landscape, the 2019-20 bushfires
20 that occurred in eastern Australia (**Figure 1**) were unprecedented in intensity and devastation (1). The
21 Black Summer fires burnt over 24 million hectares, emitted extensive amount of smoke, caused 33 direct
22 deaths, destroyed over 3,000 houses, and killed or displaced nearly three billion animals (2), making it
23 one of worst wildlife disasters in modern history (3).
24
25
26

Major bushfires in Australia



27
28
29 **Figure 1 Major bushfires in Australia 2019-20¹**
30

¹ Source: NSW Rural Fire Service (RFS) / Victoria Country Fire Authority (CFA)

1 Victoria was one of the two worst affected states (the other being New South Wales) during the
2 2019-20 bushfire season. On 2 January 2020, Victorian Premier Daniel Andrews declared a state of
3 disaster for a number of shires². Victoria witnessed the highest number of fires (N = 3,500) and area
4 burned (1,505,004 hectares) and second highest number of houses lost (N = 396) (4).

6 **Floods**

7 Flooding occurs most commonly from heavy rainfall when natural watercourses do not have the
8 capacity to carry excess water (5). Floods exert an adverse and persistent effect on agriculture, mining,
9 construction and financial services sectors (6) and are estimated to be the most costly natural disaster in
10 Australia (5). Victoria has a long history of flooding and is home to many flood-prone communities.
11 Floods cost Victorians more than \$460 million every year, and can cause significant damage to homes,
12 businesses and community infrastructure (7).

13 With further global warming over the next few decades being inevitable, and sea-levels projected
14 to continue to rise, bushfires and floods are expected to become more frequent and intense, generating a
15 need to inspect the current response strategies and identify opportunities for improvement (2).

17 **LITERATURE REVIEW**

18 To establish an understanding of the research context, the research team started with a review of
19 both academic and grey literature regarding transport stakeholders' accountability in emergency
20 management in the international context, which was then benchmarked with the prescribed roles and
21 responsibilities of Victorian bus operators under the state and local emergency response framework.

23 **Summary of Transit Agencies' Accountability in Emergency Management**

24 In the US, transportation system is designated as Emergency Support Function (ESF) #1 by the
25 federal government (8), where the crucial role that transit systems play in all four phases of emergency
26 management, i.e. mitigation (or prevention), preparedness, response and recovery is commonly
27 recognised (9-11).

28 The National Academies Press (8) described the roles of transit agencies in response to
29 emergency events: (1) promote early recognition of emergency events; (2) ensure that public
30 transportation resources are available and can be effectively integrated to support the response to and
31 recovery from emergency events; (3) expedite response to an emergency event by promoting the rapid
32 deployment of personnel and equipment; (4) coordinate the application and integration of additional
33 resources from other agencies in response to emergencies.

34 Godfrey, Saliceto and Yegidis (11) examined the roles of transit agencies in response to Hurricane
35 Irma in Florida and presented the best practices and lessons learned regarding (1) monitoring, reporting
36 the status of and securing transportation infrastructure (e.g. temporarily relocating the bus fleet away from
37 endangered areas), (2) identifying temporary alternative solutions, (3) mobilizing the necessary
38 emergency services and first responders in the disaster area, (4) coordinating and communicating with
39 emergency operations centers, state departments of transportation, and individual transit agencies.

40 National Transit Institute (12) described transit agencies as an integral part of the community's
41 emergency evacuation plan. Transit agencies possess the knowledge of evacuation routes, which routes
42 are open and which routes should be used as alternates and are capable of accommodating safe and
43 efficient evacuations (13). According to Transportation Research Board (9), transit agencies are capable
44 of moving the public, particularly transit dependent and vulnerable populations from endangered areas to
45 shelters and transporting first responders from and to critical locations in times of emergency.

46 Summarising the above, the prescribed responsibilities of transit agencies in the US generally
47 include:

- 48 (1) Monitor and secure public transportation resources for rapid disposal (8; 11);

² The shires of East Gippsland, Mansfield, Wellington, Wangaratta, Towong, and Alpine, and the alpine resorts of Mount Buller, Mount Hotham, and Mount Stirling.

- 1 (2) Identify alternative safe routes (11; 13);
- 2 (3) Mobilise resources, including personnel, equipment and etc (8; 9; 11; 12);
- 3 (4) Coordinate resources with other transit agencies and emergency support functions (8; 11).

5 **Benchmarking against the Victorian Context**

7 *Acting as a Support Function in Emergency Management*

8 In the Victorian context, the Country Fire Authority (CFA) and the Department of Environment,
9 Land, Water and Planning (DELWP) are the lead agencies for the planning, management, and suppression
10 of bushfires. The State Emergency Service (SES) is the control agency responsible for planning,
11 supporting community preparedness and managing response to floods. Similar to the US, Department of
12 Transport (DoT) is listed as a support agency in Victoria's emergency management manual (14).

13 According to Emergency Management Victoria (14), DoT's key responsibility for emergency
14 management is to minimise the impact of emergencies in portfolio areas through effective preparation,
15 coordination and response. As a support function, DoT is prescribed to respond to emergencies by (1)
16 providing immediate assistance in coordinating transport organizations, (2) facilitating professional and
17 skilled engineering and technical emergency teams, experts, equipment and material to other emergencies
18 from either the department, public transport operators or contractors as appropriate, (3) providing relevant
19 support to other agencies in the management of emergencies.

20 Emergency Management Victoria (14) focuses on the accountability of the transport coordinator
21 (DoT) in emergency management. That of individual public transport operators, which are the deliverers
22 of the function, is barely elaborated. According to anecdotal evidence, regional and rural bus operators,
23 which are typically transgenerational family businesses, contracted to provide (mainly) school bus
24 services in respective areas, have been carrying people to safety during natural disasters for generations.
25 As suggested by literature evidence, these bus operators are not bus operators alone, but appear to display
26 a level of local leadership and perform several roles within their community (15). The first gap identified
27 is that the roles and responsibilities of public transport operators as a support function are not properly
28 recognised in the Victorian context (16; 17).

30 *Responding to Public Transport Service Disruptions*

31 In Victoria, Public Transport Victoria (PTV) is the lead agency for public transport, responsible
32 for maintaining the route and school bus networks and coordinating the operational plans of public
33 transport operators (PTO). PTOs are contracted by PTV to provide passenger services. In the event of
34 major public transport disruption emergency, PTV is the interface between the state emergency
35 management framework and the PTOs where it performs a state level control role and coordinates the
36 response of each PTO immediately before (where possible), during and after the emergency (16). PTOs
37 execute operational plans at an incident level and are responsible for informing PTV of incidents or
38 disruptions to public transport services, and the subsequent response, relief, and recovery plan actions.
39 PTOs also have the following obligations with regards to service information to the community: to notify
40 passengers of any network disruptions and advice on alternate travel options; to provide safe alternate
41 travel services.

42 In the context of school bus operation, immediately before an emergency (emergency forecast),
43 school bus operators and/or drivers are expected to (1) communicate with the coordinating principal to
44 clarify whether the bus service(s) will be cancelled on the forecast day; (2) make the appropriate
45 operational arrangements to cancel the service; (3) communicate with the relevant PTV delegate as
46 required. During an emergency, bus operators are to (1) receive service cancellation instructions from the
47 coordinating principal, (2) call 000 to contact emergency services, (3) receive instruction from the
48 emergency services, and/or coordinating principal with regard to the bus's destination (i.e. return to
49 school or to another safe area) (17).

50 The second gap in knowledge is that Victorian bus operators' response in the event of public
51 transport service disruption is prescribed as receptive as opposed to proactive in the existing manual.

1 With limited documentation and recognition of their capability and undertaking, whether it be
2 formal or informal, the potential for Victorian school bus operators to play a more significant role in the
3 response to natural disasters is far from being realised.
4

5 **METHODOLOGY**

6 To gather the firsthand experiences and insights regarding bus operators' undertaking during
7 times of natural disasters, the research team conducted semi-structured interviews with individual
8 Victorian bus operators who actively participated in the response to the 2019-20 bushfires (N = 18) and
9 historical floods (N = 13). The recruitment process started around May 2020 when a call for participants,
10 which provided comprehensive information about the study was circulated among the bus operator
11 community via the Bulletin. The call was well responded to and an encouraging number of bus operators
12 registered their interest, the majority of which were deemed eligible. Interviews were then conducted
13 between September 2020 and February 2021. As data collection progressed, the research team started to
14 analyse the data by creating a list of overarching themes, which were continuously updated throughout the
15 data collection and analysis process. At the end of the data collection, the interviews were transcribed by
16 one researcher and cross checked by the other. The research team read and reread the transcripts to gain
17 familiarity with raw data. The transcripts were then imported into NVivo (released in March 2020) (18), a
18 qualitative data analysis software. The process of open coding identified new codes that emerged from the
19 data. The new codes were then compared and merged with the list of themes developed before. The final
20 themes and codes were then inspected, as well as their supporting data (quotes) and relations by the
21 research team. All the coding and data analysis were completed in NVivo.
22

23 **RESULTS**

24 Five broad themes emerged regarding bus operators' roles, responsibilities and motivations in
25 response to natural disasters: (1) possessing adequate local knowledge about the community, including
26 people, roads, and natural disasters; (2) informing decision-making during service interruptions; (3)
27 taking active parts in mobilizing resources; (4) proactive in coordination and teamwork; (5)
28 demonstrating strong sense of community responsibility.

29 As much as the accountability of school bus operators during an emergency prescribed above,
30 this study reveals that their roles are largely informal and more proactive and their responsibilities broader
31 and diverse. Further, as much as school bus operators have a legal contract to move school students
32 between home and school, they have a social contract with their community to come to help during an
33 emergency, which stems from their sense of community responsibility (19).
34

35 **Local Knowledge**

36 The principle of subsidiarity emphasises the importance of local knowledge to disaster
37 management, and particularly to disaster response. A locally led response is described as 'one of the
38 strengths of the disaster management system' and a 'foundational principle' (2). Being a local bus
39 operator and a member of the local community, they possess the local knowledge of the area, roads, when
40 and where to expect disasters, what or what not to do and are proficient with risk assessment. Therefore,
41 they were there to provide local knowledge regarding not only the risks that could arise to the community
42 in the face of a natural disaster, but also the availability of the routes.
43

44 *We know when it is going to flood, where the fires are, where to go and where not to go. –*
45 *Interviewee # Fire 10*

46
47 *The emergency responders rang for lots of directions which I was happy to give. We have*
48 *been running for years so I know the network quite well. The roads are treacherous so*
49 *deeply rely on local knowledge. – Interviewee # Fire 5*
50

1 *About Fires and Firefighting*

2 It was found that the majority of the operators interviewed, as well as their drivers are members
3 of their local CFA or have been in close relationship with CFA. Therefore, they have an in-depth
4 understanding of fires, firefighting and firefighters and are more thorough and sophisticated with their
5 approach.

6 They understand that fires are always changing and are fluid with their response.

7
8 *A normal bus operator would have jumped up and down, but because I'm a firefighter I*
9 *understand that fire doesn't run to a timetable and you've got to be fluid. For instance,*
10 *where we're told to go now, might change in a few hours' time, because the fire changes*
11 *quickly. – Interviewee # Fire 1, 5, 12, 13.*

12
13 Having worked as firefighters themselves, they are able to walk in their shoes and show empathy
14 with the volunteers.

15
16 *Getting the crew there is just the start. When I feel a call from a strike team, they sound*
17 *like they are under pressure. You've got to look after volunteers and go easy on them. You*
18 *have to feel for them. – Interviewee # Fire 17*

19
20 *About Floods*

21 *Floods in (town name withheld) are generally instantaneous and without warning. It's the*
22 *rainfall events that happen with considerable amount of rainfall in short period of time*
23 *that cut main roads. – Interviewee # Flood 3*

24
25 *We're proactive in what to do. We know after a lot of rain we're half expecting floods.*
26 *Driver knows what to expect and where to expect it. Drivers have been told not to drive*
27 *through flood waters. – Interviewee # Flood 1*

28
29 *We live in a flood zone and moderate to major rains affect us. We monitor the river levels*
30 *and do service assessments with heavy rain. – Interviewee # Flood 9,13*

31
32 **Informing Decision-Making During Service Disruptions**

33 All 13 operators interviewed said they had experienced disruptions of floods on their school runs.
34 Some operate in flood prone areas and narrated their experiences with chronic floods while others shared
35 their experiences during recent instantaneous or major floods.

36 The bus driver usually finds out about the road being inaccessible first in the morning, then rings
37 the depot who notifies the schools. Here, operators fulfilled their prescribed responsibility of monitoring
38 and reporting the status of transportation infrastructure (11).

39 All interviewees indicated their role was to liaise with a representative from the school and decide
40 whether to run the school bus service as usual, deviate, or cancel. Around half of the operators followed
41 the instructions from the school.

42
43 *We rely on advice from the school bus coordinator as to whether we can run or not. –*
44 *Interviewee # Flood 6*

45
46 *I would have to advise the school the situation in certain areas and leave it to them to*
47 *advise other government dept's as to what's occurred then wait for instruction as whether*
48 *we run or not, where we run and who we do and don't pick up. – Interviewee # Flood 9, 11*

49
50 Four of the operators indicated that they took a more proactive role in proposing and taking
51 alternative routes, which is consistent with as specified in National Transit Institute (12) that operators

1 possess knowledge of alternative routes and share it in the event the main route is impassable or
2 obstructed.

3
4 *When a driver calls us and explains what they're seeing, I call the school, inform them of*
5 *the plan and we agree what will happen. It's a shared responsibility but we lead the*
6 *decision-making process. Most principals are hands off with that sort of thing. –*
7 *Interviewee # Flood 12*

8
9 *Parents ring thru to the driver to let us know it's flooded. We take alternative different roads*
10 *to get the kids to/from school. The drivers generally assess the route and call the depot to*
11 *confirm. The school doesn't tell us too much as in the morning the phones at schools aren't*
12 *manned until 0800. We as the operator have a plan of attack when contracted services*
13 *can't run or have a cut. Schools know we do it best so they leave it to us. – Interviewee #*
14 *Flood 1, 3*

15
16 Some operators even went out of their way to get the kids to school. They reshuffled the pick-ups
17 and routes and called the parents to get the kids to accessible pick-up points to get as many kids to school
18 as possible. They also complemented the schools' role in contacting the parents to update the trip
19 information.

20
21 *Some of the kids were cut off. We just reshuffle the pick-ups and ask parents to take them*
22 *to another accessible stop and by doing this we can manage to get all kids to school. –*
23 *Interviewee # Flood 3, 8*

24
25 *Once school came back there was one bus route that couldn't operate so we combined bus*
26 *routes to get kids to school. – Interviewee # Flood 2*

27
28 *Drivers have exchanged numbers with parents over the years. As much as schools*
29 *normally talk to parents, we do at times too. I don't prosecute our staff over the matters as*
30 *its coming from a good space, but I do make it clear to them that it's not formally our role.*
31 *– Interviewee # Flood 12*

32 33 **Mobilising Resources**

34 Local school bus operators play an important role in responding to the requests for logistical
35 assistance and mobilizing resources including personnel, goods, and equipment. The value of local school
36 bus operators as part of the emergency response include their immediate access to a bus, ready for use
37 (being able to be deployed right away) and their local knowledge.

38 39 *Carting Firefighters and More*

40 Most interviewees indicated that using their school bus, they carted firefighting crews and
41 supplies in, out and around at-risk areas which were heavily impacted by the 2019-20 bushfires, as
42 marked in **Figure 2**.

43 Thanks to their first-hand firefighting experience, they coordinated the whole package with the
44 crew in addition to providing transport services.

45
46 *At (town name withheld), if others say they want our buses for instance, we will organize*
47 *everything that goes with the vehicles, including the crew and the gears. This has worked*
48 *well over time and this works the best for the crew's morale. – Interviewee # Fire 15*

49
50 *Because I've got the firefighting experience, I'll talk to the operator and the driver and*
51 *give them the pre-trip briefing. Interviewee # Fire 13*



Figure 2 Locations attended to by bus operators interviewed

Mobilising the Community

Bus operators have social connections with the residents in their community – social contracts as it is, that they can be depended upon to move people in, out and around their communities during emergencies. They took active part in (1) evacuating people, transporting them to safety, comforting the displaced public, and sheltering victims; (2) delivering supplies and taking people for supplies.

(1) Most operators mentioned that they responded to the evacuation request from various groups under different emergencies.

When the town was evacuated, our bus was used to take people out to (town name withheld). We also used a wheelchair accessible school bus to evacuate the elderly resident home where we moved about 100 pax. – Interviewee # Flood 2

In times of crisis, for example, flood and fire evacuation, the community knows it can rely on us to provide transport solutions quickly and often free. – Interviewee # Fire 2

We also carted displaced public from (town name withheld) to the (town name withheld) emergency centre. Displaced people are often under a lot of stress and upset. We knew a few of these people. We tended to play a comfort role to them and reassure them it will be ok. People tell us they get a bus from out of town and they get it a driver. Use a bus from our town and we get ownership and care. – Interviewee # Fire 5

(2) Apart from moving people in and out, they helped distribute meals, goods, and supplies among the community.

We didn't just cart people, we also took food and water and other essential items out to people. – Interviewee # Fire 5,7

We also took pumps and equipment into the (area name withheld). – Interviewee # Flood 2 After the fires hit on NYE, the (town name withheld) City Oval became a refuge centre and one of the helpers there rang to ask if we could run a shuttle service for people, mainly

1 *older people, to go from the oval into town to get supplies. We did this free of charge for 5-*
2 *6 days. – Interviewee # Fire 6*

3
4 In providing these functions during emergencies, bus operators demonstrate their commitment to
5 responding effectively to natural disasters and supporting the needs of the community.

6 7 **Coordination and Teamwork**

8 Bus operators know their own business as well as their peers responsible for operation in the
9 neighbouring regions. They are able to ascertain the resources available within their region and take the
10 responsibility of managing and allocating those resources. They demonstrated strong leadership and
11 collaboration within the bus industry in response to the emergencies. They acted as the regional
12 coordinator to optimise the bus supply. The operators also supported and covered for each other as some
13 were fighting fires themselves.

14
15 *We contacted a few operators. It was a combined effort between ourselves, (individual*
16 *name #1 withheld), (individual name #2 withheld). We coordinated the buses as (#1 and*
17 *#2) were on the ground fighting the fire. – Interviewee # Fire 7*

18
19 *We shared the work around amongst plenty of operators in the area, both large and small.*
20 *because I was also fighting the fires. – Interviewee # Fire 14*

21
22 *I got a phone call and they needed a bus to pick fire crews up from (border town name*
23 *withheld) in NSW and brought down to (town name withheld). I referred them on to the bus*
24 *companies in those areas. – Interviewee # Fire 13*

25
26 Most of the interviewees indicated that they were approached by CFA for bus supply during the
27 2019-20 bushfire season. They have established long-term and trusted relationships with CFA and are the
28 ‘first call’ or ‘go to person’ in the instance of crews needing to be carted. A few operators registered
29 themselves on the emergency panel of DELWP.

30
31 *I get phone calls at any time of the day or night saying we need a bus now. They call me*
32 *because of my knowledge of the bus industry and they know I can get them a bus quickly.*
33 *This is a relationship or degree of trust that’s been built up over the years. – Interviewee #*
34 *Fire 13*

35 36 **Strong Sense of Community Responsibility**

37 Bus operators were ready to contribute their resources and services whenever the community
38 needed. They even went out of their way to do the community good. They assumed responsibilities
39 including providing employment, looking after people at relief/refuge centres, organising fund-raising
40 activities for victims and fire fighters, helping with road access etc.

41 When asked why they did what they did, the operators demonstrated a strong sense of community
42 responsibility (SOCR), which is a feeling of personal responsibility for the individual and collective well-
43 being of a community of people not directly rooted in an expectation of personal gain (19; 20). Nowell
44 and Boyd (19) assert SOCR is a unique construct representing an obligation and duty to protect and
45 enhance the well-being of a community and its members. This theoretical construct underpins bus
46 operators’ undertaking in times of both bushfire and flood.

47
48 *We let people use our bus for free on many occasions. It’s a sense of part of the community,*
49 *and part of the job of being a bus operator. – Interviewee #Fire 2*

50

1 *I donated two buses to the SES in Sale when they were evacuating (town name withheld).*
2 *That's \$7K revenue I didn't charge. – Interviewee # Fire 11*

3
4 *It's all about community. We just made ourselves available if they needed us and we'd*
5 *continue to make our resources and services available to anyone. We were there if they*
6 *needed us. – Interviewee # Fire 7, 15*

7
8 *We know where everyone in our community lives and we have all their telephone numbers.*
9 *No-one else has that. We called them all, are you safe, are you all out, do you need anything.*
10 *We feel personally responsible to our local community and their ongoing welfare. –*
11 *Interviewee # Fire 16*

12
13 *We did ourselves out of a bit of money. They planned on sending the US crew down to*
14 *Mornington to do a bit of fishing. We organized them to do a fishing charter/golf here in*
15 *Lakes Entrance as we've got everything here. We kept it local for travelling community and*
16 *lost the charter job. But it was the right thing to do. – Interviewee # Fire 8*

17
18 *It's our town and we look after those within our patch. We always have. – Interviewee #*
19 *Fire 4*

20
21 *No one from government asked us to do stuff for them. We just went and did it. Its part and*
22 *parcel of living in a rural community. I president and treasurer every community group in*
23 *our area and it is important that we support each other to survive and prosper. –*
24 *Interviewee #Fire 9*

25 26 **DISCUSSION**

27 Efficient communication and coordination are listed as the keys to effective emergency
28 management (21). The emergency situations contained herein (bushfires and floods) also emphasized the
29 importance of communication and coordination in emergency management.

30 31 **Challenges with Communication**

32 Efficient communications within and across the departments, and between public/private sector
33 organizations and the public are critical to the response to disasters. Emergency response highlights the
34 importance of communications not just between state and local government departments/officials
35 (DEWLP, DET, DOT), emergency management agencies (CFA, SES), but with transport service
36 providers and stakeholders (e.g. schools). However, issues with communication in the following aspects
37 were identified in the response to bushfires and floods: (1) facilities; (2) availability of personnel; and (3)
38 disagreement in risk assessment.

39 During natural disasters like bushfires and floods, communication facilities like communication
40 towers are likely to be destroyed, which can greatly impair the response to disasters.

41
42 *Communication is always a problem. The phones always go out. Happens with every*
43 *disaster. CFA truck radio system was down as well. CFA was trying to liaise with DEWLP*
44 *but too hard. The principal people who were running the show don't have communication.*
45 *– Interviewee # Fire 16*

46
47 *The difficulty in that is that we have one of the poorest mobile coverage areas in the state,*
48 *which is a significant gap. – Interviewee # Flood 12*

1 Availability of the party responsible is also an issue. Six out of the thirteen operators interviewed
2 experienced problems with communications during their flood event as they couldn't get in touch with
3 schools for liaison.

4
5 *The school doesn't tell us too much in the morning as the phones at schools aren't manned*
6 *until 0800. We're generally left to our own devices to make a call. The decision fell to my*
7 *risk assessment and knowledge. – Interviewee # Flood 3, 9*

8
9 *The school disappeared. I got home and rang the mobile number to the senior teacher at*
10 *the school and nobody ever picked up. – Interviewee # Flood 10*

11
12 There have also been times of disagreement on risk assessment and the communication among
13 the parties did not go well.

14
15 *I was apprehensive to run and rang the school, the Principal was adamant I should run*
16 *because she had not been advised there was going to be issues with trees down and flooding*
17 *(from anyone else other than me). The risk of running was too high and I should not have*
18 *run. I was angry the school ignored my advice and local knowledge. – Interviewee # Flood*
19 *11*

20
21 *We were in the dark as well and undertook minor diversions on a couple of our school runs.*
22 *Then we got calls from (two schools' names withheld) saying we should not run if a*
23 *diversion from the set route was needed. I was told by a DET representative that any*
24 *diversion of a school bus run is prohibited and that if there is a road closure the bus is not*
25 *to run (as that is the policy). I explained that this has not been the practice in the 15 years*
26 *I've been managing this task, that diversions are commonplace managed by the local*
27 *operator and DOT staff and that cancelling afternoon runs for no discernible safety*
28 *outcomes created risks of its own. – Interviewee # Flood 4*

30 **Challenges with Coordination**

31 Emergency management highlights the significance of coordination between federal, state, local,
32 civilian and military, public, private, and non-profit agencies and organizations (22). The capabilities of
33 transit agencies during emergencies are profoundly affected by the decisions and directives of others,
34 including federal, state, and local government departments (DET, DOT, DWELP), emergency
35 management agencies (CFA, SES). Efficient emergency response requires seamless coordination between
36 transit agencies and other emergency support functions (11; 23).

37 One consistent theme was that while most individual operators had made some preparations and
38 plans for themselves, there was no coordination or formal structure from the transport department during
39 emergency management. At no time did the bus operators receive instructions from Public Transport
40 Victoria (PTV) - the contracting entity or the Department of Transport (DOT) – the department
41 responsible for setting operational policy.

42
43 *Never heard anything from PTV/DOT during this time. – Interviewee # Fire 1, 7, 11, 12,*
44 *13, 15, 16, 17*

45
46 Efficient response to emergencies requires effective coordination of resources (23). However, a
47 common theme came out of the interviews was that there were two processes happening in parallel rather
48 than one process in sequence and the information was not shared across departments, which usually led to
49 confusion, overallocation and waste of transport resources.

50

1 *We were told to drop people at an airport then return straight away, but we would wait and*
2 *make sure they got on the plane as there have been instances where the planes didn't come.*
3 *– Interviewee # Fire 16*

4
5 *I was asked to take my bus out to (town name withheld) and collect firefighters at the*
6 *airport and take them to the township. I arrived and there was no plane. I made some calls*
7 *and was told the plane had come a few hours earlier and another operator had moved them.*
8 *– Interviewee # Fire 5, 7*

9
10 *I was asked by Victoria CFA³ in November to take strike teams from north east area up into*
11 *(town names withheld). NSW RFS⁴ eventually took that over and we returned empty. –*
12 *Interviewee # Fire 14*

13
14 *They could have used the resources a bit better. I drove up there but there were buses sitting*
15 *up there unutilized. – Interviewee # Fire 3*

16
17 These examples are all consistent with the Australian Government's report which stated that in
18 response to "more frequent and intense" natural disasters in coming decades, there needs to be better
19 national coordination of Australian Government resources and emergency responses among different
20 levels of governments (2).

21 In order to achieve the most effective emergency response, it was then recommended that (1)
22 mechanisms be put in place post-haste so education of governance framework and refining of
23 communication protocols amongst all critical stakeholders during natural disasters can occur on an
24 enduring basis; (2) the Department of Transport and Public Transport Victoria be more involved in
25 coordinating and deploying public and community transport systems during emergencies; (3) a local bus
26 operator be dedicated as the go-to person to coordinate the buses; and (4) public transport providers be
27 incorporated in local emergency management plan and be more actively involved with their local
28 communities in planning and preparing for emergencies (8).

30 CONCLUSION

31 This study investigated the experiences of regional and rural school bus operators in times of
32 bushfire and flood. Five broad themes emerged regarding their roles, responsibilities, and motivations in
33 response to natural disasters. Issues in need of improvement were revealed, and recommendations were
34 made accordingly.

35 It was found that the roles and responsibilities of operators in instances of bushfires and floods
36 are more proactive and diverse than prescribed and are largely informal. Further, apart from adhering to
37 formal procedures during an emergency, the school bus operators appeared to have a social contract in
38 place with their communities to contribute their knowledge and resources to serve and save the
39 community, which stems from their sense of community responsibility. These findings demonstrated the
40 value of regional and rural school bus operators as part of a community level response to natural disasters.

41 Several challenges with communication and coordination during recent bushfire and flood events
42 were discussed. The following recommendations were then made: (1) the education of governance
43 framework and communication protocols amongst critical stakeholders be enhanced; (2) transport
44 coordinators be more involved in coordinating transport systems during emergencies; (3) a local bus
45 operator be proactively engaged in local emergency planning, preparation and response. It is believed that
46 the formal implementation of sharing the lessons learned following bushfire and flood events will
47 contribute to ensuring a paradigm of continuous improvement, a shared understanding and non-
48 complacency in respect of operator and state preparedness, response, and recovery activities.

³ CFA is a volunteer-based firefighting agency in Victoria, Australia.

⁴ RFS is a volunteer-based firefighting agency in New South Wales, Australia.

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6 **AUTHOR CONTRIBUTIONS**

7 The authors confirm contribution to the paper as follows: study conception and design:
8 Christopher Lowe; data collection: Christopher Lowe, Jianrong Qiu; analysis and interpretation of results:
9 Christopher Lowe, Jianrong Qiu; draft manuscript preparation: Jianrong Qiu, Christopher Lowe. All
10 authors reviewed the results and approved the final version of the manuscript.

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