
0.0 INFRASTRUCTURE RECOVERY & RESILIENCE – NATURAL DISASTERS

Responsible Officer: Warren Sharpe OAM - Director Infrastructure Services

Attachments: Nil

Community Goals: 2 Our community that welcomes, celebrates and support everyone

Community Strategy: 2.4 Foster a safe community

Delivery Program Link: 2.4.4 Work with agencies and emergency services to coordinate emergency management and improved resilience

Operational Plan Link: 2.4.4.4 Works with the NSW Government to deliver the Eurobodalla Regional Integrated Emergency Services Precinct

2.4.4.6 Advocate to the NSW and Australian Governments to fund improve resilience of local roads and bridges, evacuation centres, water and sewerage systems, power supply, telecommunications and highways

EXECUTIVE SUMMARY

Eurobodalla has experienced ten declared natural disasters, with the bushfires in 2019-20 and nine subsequent declared natural disaster floods.

These natural disasters have had a significant impact on the Eurobodalla community and caused extensive damage to local road and bridge infrastructure, loss of power, loss of telecommunications, damage to water and sewerage infrastructure and significant operational challenges due to the loss of power and telecommunications and loss of highway access impacting resupply.

The purpose of this report is to provide an overview of the extensive work done since the Black Summer bushfires to recover our local road and bridge infrastructure and deliver 'in-perpetuity' improvements to address these specific issues.

RECOMMENDATION

THAT

1. The update report on the extensive works undertaken to date on recovery of local roads and bridges following the ten natural disasters impacting Eurobodalla be received and noted.
2. The work undertaken to improve the resilience of local roads and bridges, highways, water and sewerage systems, power supply and telecommunications be noted.
3. Council continue to advocate for further support from the NSW and Australian Governments to proactively improve the resilience of the infrastructure our community depends on during and after natural disasters.
4. Suitable motions be prepared to take to the LGNSW Conference seeking the support from the broader sector to advocate to the NSW and Australian Governments for:

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- (a) Proactive funding programs from the NSW and Australian Governments to upgrade local roads, bridges and other infrastructure to improve community resilience, taking account of the social equity challenges in rural Australia.
- (b) Greater flexibility under the Natural Disaster Relief and Recovery Arrangements to build Council's transport and related infrastructure back better.
- (c) Continued review and improved integration of emergency services agencies with increased decentralisation to regional NSW.
- (d) Removal of the cost of funding NSW Government agencies from Local Government including the NSW Rural Fire Services, NSW State Emergency Services and NSW Fire and Rescue.
- (e) Provision of additional funding to Essential Energy to improve the resilience of power lines and supply to critical infrastructure sites (such as telecommunications towers and exchanges, water supply and sewerage schemes, aged care facilities and vulnerable communities).
- (f) Provision of additional funding to improve the resilience and coverage of telecommunications facilities across regional Australia.
- (g) Provision of continued work to improve the resilience of State highways.
- (h) Changes in regulation and funding incentives to improve the resilience of aged care facilities, fuel service stations and major food retailers, including but not limited to back-up and alternate power supply systems and satellite communications.

BACKGROUND

Eurobodalla has experienced the following natural disaster events in recent years:

- i) Natural disaster bushfires 26 November 2019 to 3 March 2020
- ii) Natural disaster floods
 - a. February 2020
 - b. July 2020
 - c. August 2020
 - d. October 2020
 - e. December 2020
 - f. March 2021
 - g. May 2021
 - h. December 2021
 - i. February 2022

COVID-19 also provided significant challenges from March 2020.

These natural disasters have had a significant impact on the Eurobodalla community and caused extensive damage to local road and bridge infrastructure, loss of power, loss of telecommunications, damage to water and sewerage infrastructure and significant operational challenges due to the loss of power and telecommunications and loss of highway access impacting resupply.

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Immediately post the bushfires, a Eurobodalla Infrastructure Resilience Plan was developed as a working document to inform actions to be taken arising from lessons learnt.

At a high summary level, this report outlines key actions to date to recover our infrastructure and the status of other actions taken to improve overall infrastructure resilience to reduce impacts in future natural disasters.

The recovery work and actions to improve resilience have been built into the Delivery Program and Operational Plan and will continue going forward.

CONSIDERATIONS

There has been significant advocacy work undertaken in this space already including direct contact with the respective agencies, meetings and various letters to relevant Ministers by the Mayor and past Mayor as well as partnering with community and business on advocacy.

To tell the Eurobodalla response story and offer solutions to lessons learnt, to gain wider sector support for positive change and to support other councils and personnel across the sector, the Director Infrastructure Services has given presentations to various major events including:

- a) Australian Local Government Association – National Roads, Regions and Resilience Conference Wagga Wagga – 16 November 2020
- b) National Municipal Works and Engineering Conference – 11 March 2021
- c) NSW Local Roads Congress – Parliament Theatre Sydney – 7 June 2021
- d) Institute of Public Works Engineering Australia – Young IPWEA Leadership Program – Leading in a Crisis – Virtual Across Australia and New Zealand
- e) South East Australian Transport Strategy Inc – 13-14 May 2021 Goulburn
- f) South East Australian Transport Strategy Inc – 20 August 2021 (virtual meeting)
- g) Local Government Procurement – Sector Article - 28 August 2021
- h) South Gippsland Shire Council – 28 October 2021
- i) Keynote address IPWEA NSW/ACT State Conference – Parliament Theatre Canberra – 10 March 2022
- j) University of Technology Sydney 8 September 2022.

These presentations have helped secure broad sector support on critical advocacy matters from Local Government NSW, Australian Local Government Association, IPWEA NSW/ACT and IPWEA Australasia, NSW Country Mayors, South East Australian Transport Strategy Inc, NSW Roads and Transport Directorate and others. These opportunities have also allowed direct discussion of critical infrastructure issues face to face with senior agency personnel and Members of Parliament at a State and Australian Government level.

This follow-on work supplemented and extended the work undertaken in preparing submissions to the NSW Bushfire Inquiry and the Royal Commission into National Natural Disaster Arrangements (which are publicly available on Council's website at [Bushfire inquiries and Eurobodalla Council submissions | Eurobodalla Council \(nsw.gov.au\)](https://www.eurobodalla.nsw.gov.au/bushfire-inquiries-and-eurobodalla-council-submissions)).

The majority of recovery work is funded by the NSW and Australian Governments under the Natural Disaster Recovery and Relief Arrangements (NDRRA). These arrangements often require complex investigation works to be completed upfront to inform negotiation on all significant recovery works, using estimates of costs and agreed methods of repair. We have negotiated a mix of solutions.

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The overriding principle set for our team has been to ‘build back better’ within a funding environment that is focussed on replacement of ‘like for like’, whilst maintaining integrity in our actions with the funding arrangements under NDRRA. This often requires lateral thinking about solutions, development and costing of multiple solutions to evidence that the more resilient solutions can be achieved at a lower cost and/or juggling other Council or grant funding to produce the best result.

This can be a challenging arrangement and does require ongoing communication with the community to outline the process in a time critical environment.

The new Councillors were taken on a full day tour of the Deua Valley on 18 March 2022 to see the many challenges firsthand and to talk to community members. This tour was well received and enabled a strong insight for new Councillors into the community impacts and infrastructure recovery and resilience challenges on Araluen Road, and more generally across the western sectors of the Eurobodalla.

The overall scale of the effort by the Infrastructure Services team, and more broadly the organisation, in continuing the recovery from the 2019-20 bushfires and the nine declared natural disaster floods since is quite incredible. This report can only provide a higher-level overview.

Nevertheless, it is important to place this information into the ordinary business paper of Council for the public record.

1. Local Roads and Bridges

1.1 Overview

The bushfires and repeat floods have caused major damage impacts to roads, drainage structures, bridges, roadside vegetation and ancillary road infrastructure (eg guardrail, guideposts, signage and the like).

The areas west of the Princes Highway were particularly impacted being the key bushfire affected areas of the Eurobodalla. The diagram below shows the approximate area impacted by the bushfires across Eurobodalla and the adjoining parts of neighbouring LGAs.

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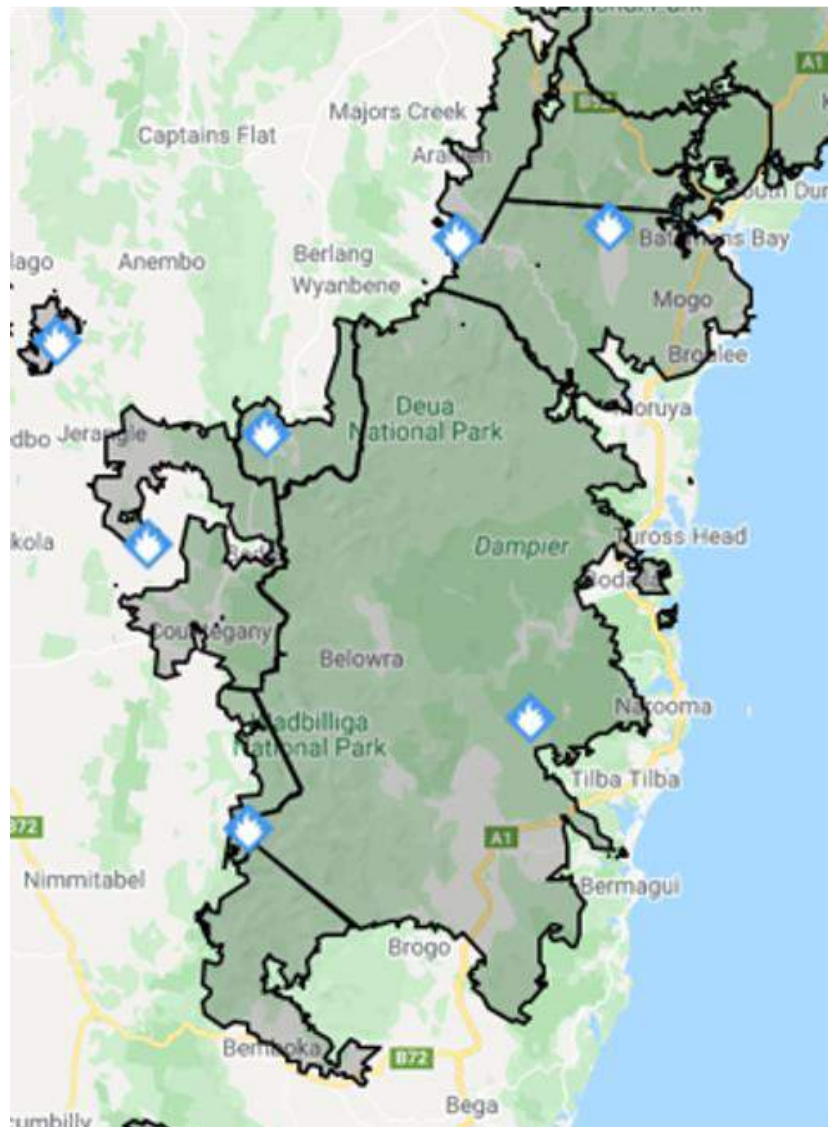


Figure 1 – Approximate fire impacted area (source RFS Fires Near Me)

Each repeat natural disaster event requires extensive work on disaster response (both as Council and through the Emergency Operations Centre team in the role of Local Emergency Management Officer); emergency clean-up and initial repair; assessment of the additional damage and solutions; submission of requests for funding through the Natural Disaster Relief and Recovery Arrangements (NDRRA); planning of work and identification of resourcing, procurement of services, specialist engineering advice and investigation where required (eg geotechnical work on landslides, bridge design); delivery of works; extensive communication with impacted communities, agencies, Members of Parliament and the media; engaging contractors and provision of resources (eg bridges components, materials supply), delivery of works and administration of a diverse and complex array of works, financial tracking, submission of reports to the funding authority and administration of payment.

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The extent of the bushfire devastation followed by such intensive rainfall meant that our landscape was vulnerable to erosion with bare catchments exposed. This resulted in large volumes of ash and sediment reaching our roads, blocking drainage lines. Combined with multiple floods and saturated soil conditions, roads and batters suffered extensive landslides and longitudinal cracking. The clean-up and removal of waste from properties was essential, however this too added to the damage to the road network.

These events and the associated response and recovery works also required the management of extensive risk to the community, to first responders in emergency response (including Council teams) and throughout the ongoing recovery period.

To better manage the workload within the Infrastructure Services team, a separate Disaster Recovery team with a mix of internal staff seconded to lead that team and external contractors was established. This team has been supported under the NDRRA funding arrangements and included recent retirees with Finance and Procurement expertise who agreed to come back and assist in the recovery of our community.

To backfill the key internal roles, many of our younger team members, developed through our extensive Cadet and Apprenticeship roles, have successfully stepped up in a supported environment to take on more senior business-as-usual roles.

The nature of the ebb and flow of repeat natural disasters also requires the support and acknowledgement of the extensive trauma within the community and our workforce who are also a part of our impacted community. This includes some team members who lost their homes and/or experienced other losses during the disasters.

The impacts of such frequent natural disaster events have inevitably impacted the wellbeing and morale as momentum in recovery is gained, only to have the community and team rocked by yet another natural disaster, setting progress back.

The extensive limitations of the ongoing weather, COVID-19 and supply chain shortages have also created many challenges, all of which have been managed and overcome to deliver recovery works and extensive advocacy to bring about positive change in a move toward future infrastructure resilience.

Throughout this period, Council's team has shown extraordinary commitment to the Eurobodalla community going well beyond normal operational activities for such an extensive period of time. There has also been significant additional workload placed on the central support service teams who have offered strong level of support in a whole of organisation effort despite COVID-19 and other impacts on staff availability.

1.2 Local Roads

The ten natural disasters have resulted in over two thousand damage sites across the local road network. This damage is recorded within Council's systems including Recover to allow tracking and administration of the natural disaster claims. It is not practicable to record the damage at all of these sites in this report, noting that some sites have been repeatedly damaged in multiple events.

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The following provides a higher-level summary.

1.2.1 Unsealed roads

Council maintains about 404km of unsealed roads. The recovery works to date in the western sector has required extensive works including but not limited to:

- i) Repeat disaster response operations, clearing of fallen timber, temporary repairs to allow continued access
- ii) Extensive programs of culvert and drain clearing to re-establish drainage functionality
- iii) 138km of repair maintenance grading of unsealed roads
- iv) 78km of gravel resheeting on the local roads plus 6km for the alternate detour route via Mt Wandera for Araluen Road. The value of this work exceeds \$5 million and is approximately equivalent to five years of our normal resheeting program. This work is now 72% complete with a further 22% in progress under contract
- v) Removal of fire impacted trees including both the initial tree collapse and high risk trees, then the subsequent secondary tree death as assessed by qualified arborists. Of the 490km of local roads within the bushfire zone, approximately 343km was assessed as requiring treatment for hazardous trees. This work is now approximately 95% complete.

1.2.2 Sealed roads

The damage to the sealed road network able to be claimed under the NDRRA funding is significantly less than across the unsealed network except for the damage identified under Bridges and Major Structure outlined within this report.

However, the ongoing natural disasters and saturating wet weather has resulted in the decline of the sealed road network along with numerous minor defects such as potholes, shoves and other failures. Many of these aspects are not eligible under the NDRRA arrangements.

Council is pursuing additional grants under programs such as the NSW Fixing Local Roads program to help restore the condition of the sealed road.

1.2.3 Landslides and slope instability

There have been extensive landslides across Eurobodalla, particularly in the mountainous terrain in the western sector.

These damage sites all require careful consideration of the risks, assessment to determine if external geotechnical expertise is required, engagement of suitable geotechnical specialists and site investigations, development of options, agreement with Transport for NSW on solutions to be covered under the NDRRA, procurement, engagement of contractors and project delivery.

A mix of solutions was required from relatively straight forward removal of material, use of conventional treatments such as gravity retaining structures to complex and specialized geotechnical stabilisation techniques.

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The following is a high-level list only of the major landslide areas:

Araluen Road:

- 11km site – earthworks complete, minor retaining required, materials won recycled to achieve other road safety benefits at other sites
- 14km site – earthworks complete, minor retaining required, materials won recycled to achieve other road safety benefits at other sites
- 18km site – geofoam wall underpinned and embankment stabilisation extended 40m. Substantially complete.
- 19km site – urgent stabilisation in narrow cutting March 2021. Damage increased in March 2022 with stabilisation works complete August 2022. Additional LRCIP grant funding provided to extend treatment area. Substantially complete.
- 22km mark (see photos below) – this landslide closed the existing road. Detailed investigations to repair the existing road compared to a new more resilient alternate route around the site were undertaken. Approval to build the new alternate road was gained in June 2021 and the new road opened to traffic on 10 December 2021. Works are now substantially complete with a new more resilient sealed road provided for the Deua Valley community. Materials won being recycled to provide improved road surfacing elsewhere on Araluen Road under a Fixing Local Roads grant.
- 24km site – urgent works in May 2022. Stabilisation of embankment. Additional LRCIP funding of rock scaling and cutoff drainage improvements. Stabilisation works complete. Gravelling and sealing to be completed.
- 41km sites – three sites in West Merricumbene area. Major stabilisation works are currently in progress and programmed for completion September/October 2022. Additional LRCIP grant funding has been provided in round 2 and 3 to further improve resilience, improve road width and road safety, which will be completed over 2022-23.
- 43km site (see photos below). Major downhill and uphill landslides closed the road indefinitely. Detailed geotechnical investigations were undertaken, and designs prepared, including assessing alternate routes around the landslide sites. The alternate routes were deemed not to be a viable option and after briefing Council, detailed designs proceeded for the works required to re-open the existing road. The tenders for these works were reported to Council at the meeting of 23 August 2022. Contracts have now been awarded for the specialized geotechnical works to proceed with a view to completion during 2022-23.
- 45km site – slope stability works commenced in February 2022. The March 2022 floods resulted in the scale of the works tripling to 150m. These additional works were incorporated in the extended urgent works at the 18, 19 and 24km marks. The stabilisation works at the 45km mark were completed in June 2022.

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Larrys Mountain Road:

- Several minor sites repaired
- Two more significant sites in scoping/design with a view to being completed during 2022-23

Reedy Creek Road:

- Four embankment damages sites
- Site 1 - Dignmans Creek, earthworks complete, final stabilisation to be completed.
- Site 2 - Eurobodalla, scaling complete
- Site 3 – Eurobodalla, in design
- Site 4 - remote site with difficult access currently in design.

Centenary Drive:

- 40m length of embankment damage causing lane closure. Currently in detailed design and approvals phase.

Nerrigundah Mountain Road:

- Multiple damage sites with a 5 tonne load limit still in place
- Scoping complete, commencing design with a view to completion during 2023

Cadgee Mountain Road:

- Three embankment damage sites. Scoping complete, commencing design with a view to completion in 2023
- Additional drainage and repair work completed under other grant funding to improve resilience and allow removal of the 5 tonne load limit.

Eurobodalla Road:

- Three embankment damage sites in scoping/design
- Batter scaling completed.

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Photo 1 – Araluen Road

Major landslide area at 22km mark with adjoining minor slides either side over an extended length. This section has now been bypassed by a new alternate route over the mountain.



Photo 2 – Araluen Road

Major landslide at the 22km mark extending approximately 30-35m upslope

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Photo 3 – Araluen Road

22km mark with new alternate road now substantially complete, with Mt Wandera telecommunications tower in the background (peak on top right-hand side)



Photo 4 – Araluen Road

22km mark looking north with the old road with landslides in the foreground. Despite the new road being built in mountainous terrain clever design has meant the maximum road grade is only 12.5% vertical grade. The old road and tracks have been restored. Only minor drainage and restoration work remains to be completed.

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Photo 5 – Mt Wandera Trig Road

This was the alternate access for Deua Valley residents via Mt Wandera until it collapsed in the natural disaster flood on 10 December 2021. Council's works were sufficiently advanced at the 22km mark on Araluen Road to allow it to be opened to resident-only traffic.



Photo 6 - Araluen Road

Slope instability developed below the existing foam block wall at the 18km mark requiring urgent soil nailing works to stabilize the natural slope

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Photo 7 – Araluen Road

19km mark is just one example of the sites requiring extensive geotechnical stabilisation in a constrained location. The soil nailing work was extended using other grant funds beyond the work able to be funded under NDRRA whilst crews were on-site, facilitating a more resilient outcome for the community



Photo 8 Araluen Road

Many of the sites that suffered landslide or instability were in extremely steep terrain and required specialized geotechnical solutions to stabilize the existing side slopes. This photo shows the soil nailing work being progressed.

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Photo 9 Araluen Road

The major landslides at the 43km mark occurred in extremely steep terrain closing the road indefinitely. This 3-D animation was created by Council's in-house teams using drone survey technology to assist assessment of recovery options.

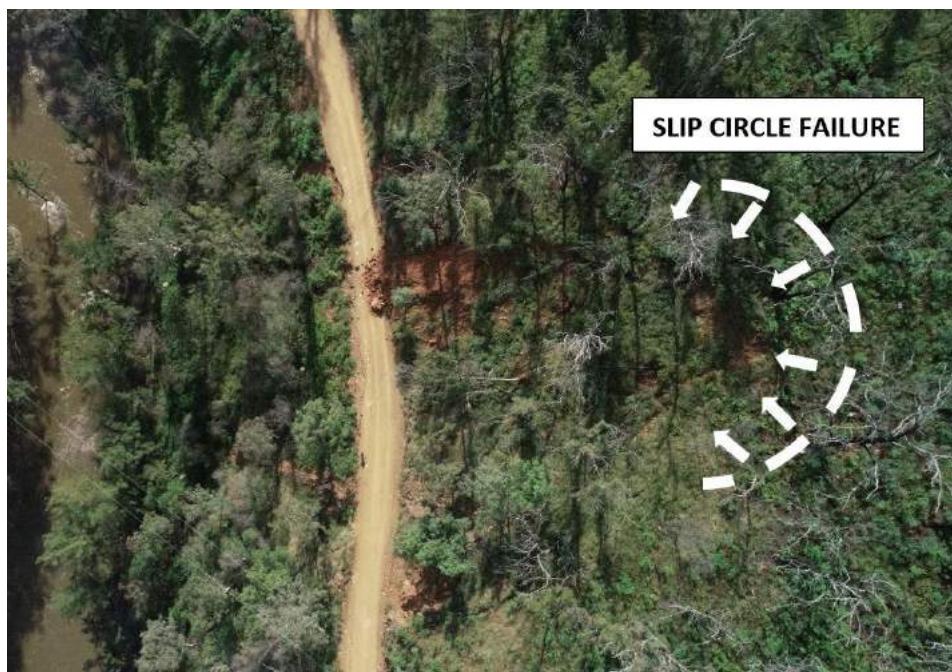


Photo 10 – Araluen Road

Drone technology allowed identification of a major landslide developing 35-40m above the landslides visible at road level. Detailed geotechnical investigations followed to develop solutions to recover the roadway and contracts have now been awarded to allow works to proceed over 2022-23 to treat the failed sections.

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Photo 11 – Araluen Road Merricumbene

Additional grant funding was sourced to allow commencement of resilience works to mitigate the risk of further road collapse into the Deua River. A further stage is funded and planned for 2022-23. Additional grant funding will need to be sourced to continue this work.



Photo 12 – Araluen Road Merricumbene

Additional grant funding was directed to allow re-use of materials won from resilience works to stabilize existing batters and widen corners to allow safer travel along Araluen Road

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1.3 Bridges & Major Culverts

Eighteen timber bridges were destroyed or significantly damaged during the bushfires resulting in seventeen full replacements and one repair. One other bridge was severely damaged in the subsequent July 2020 floods, also requiring full replacement.

The location of the disaster affected bridges is shown schematically in Figure 2 and listed in Table 1 below. Attachment A shows photos of the disaster impacted bridges after the disaster and following reconstruction/repair.

A separate Bridge Reconstruction team was created working with a Senior Projects Engineer working with existing personnel to deliver the rebuilding of the nineteen disaster impacted timber bridges and other major structures. This team is also responsible for delivering other bridge replacements under the Local Roads and Community Infrastructure Program (LRCIP), Fixing Country Bridges Program and Garlandtown Bridge on North Head Drive.

The replacement of pre-existing timber bridges with concrete bridges has resulted in a major improvement in community resilience and also offers a substantial increase in load carrying capacity to permit access for firefighting equipment during and post natural disaster events (eg large excavators and dozers).

Most structures have been lifted marginally improving flood performance, although the funding requirements under the NDRRA have constrained the benefit that would have otherwise been achieved in a number of cases.

Completion of bridges during a period of nine disaster floods and such an extended wet period is obviously challenging as temporary structures were repeatedly washed away and construction within gullies and waterways particularly affected by wet weather flows and floods.

This unprecedented level of timber bridge replacement with new concrete structures in Eurobodalla, has also significantly improved community and first responder safety, providing an 'in-perpetuity' benefit to the community, farmers, businesses and Council as well as Government agencies such as the National Parks and Wildlife Service, Forestry Corporation NSW and emergency response agencies.

Most concrete structures have also had the approaches sealed to better protect the new bridges and deliver improved environmental outcomes for the adjacent waterways.

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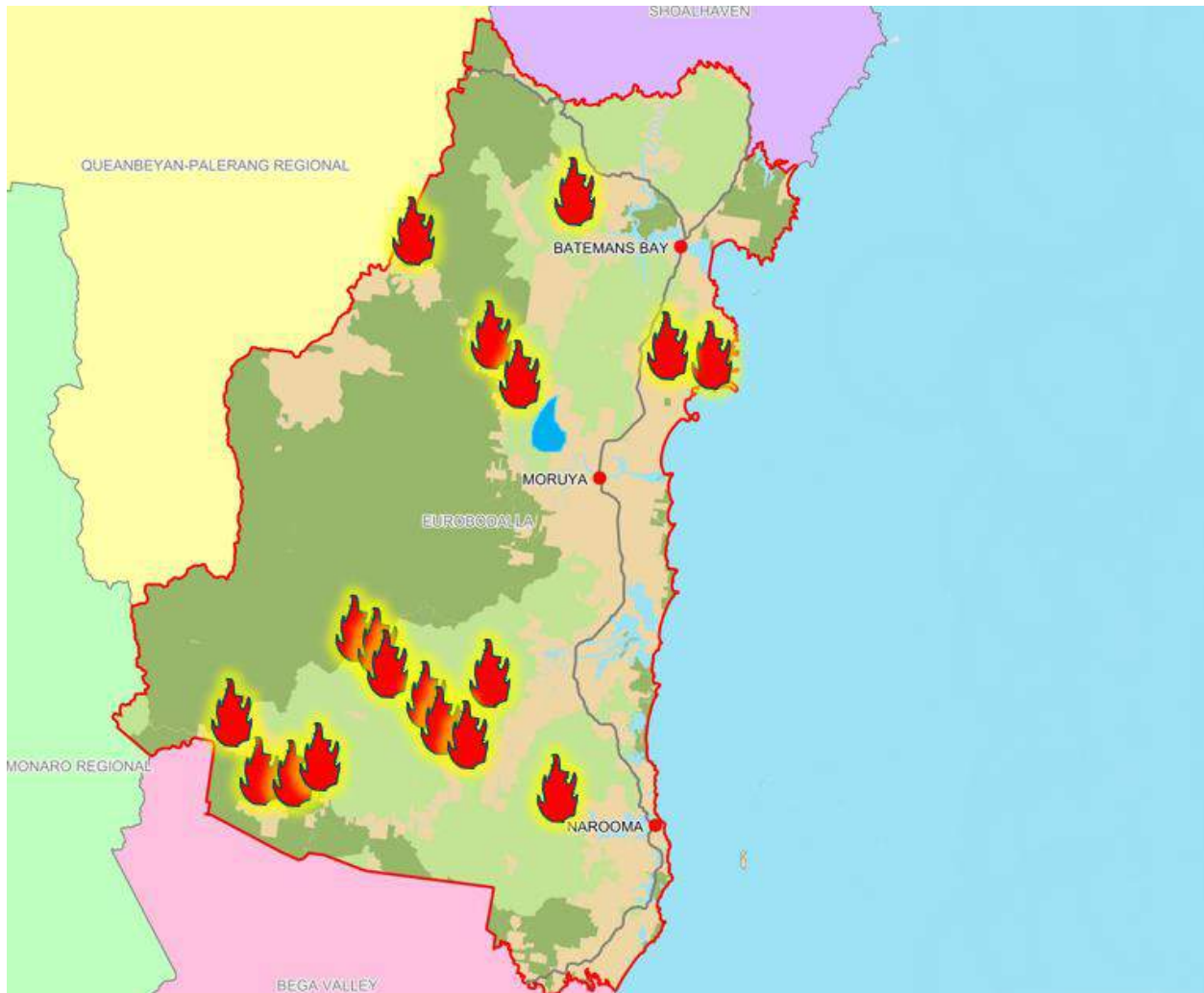


Figure 2 – Schematic showing the bushfire and flood impacted timber bridges across Eurobodalla

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Bridge	Road & Location	Status
Clarksons Bridge	Wagonga Scenic Drive, Narooma	Repair complete
Rosedale footbridge	Rosedale village	Complete
Cheese Factory bridge	Eurobodalla Road, Eurobodalla	Complete
Reedy Creek bridge	Eurobodalla Road, Cadgee	Complete
Peach Tree bridge	Eurobodalla Road, Cadgee	Complete
Murphys bridge	Eurobodalla Road, Cadgee	Open to traffic
Sinclairs bridge	Eurobodalla Road, Cadgee	Complete
Gulph Creek bridge	Nerrigundah Mtn Road, Nerrigundah	Complete
Comans bridge	Gulph Creek Road, Nerrigundah	Complete
Belimbla bridge	Belowra Road, Belowra	Complete
Sitters Ditch bridge	Belowra Road, Belowra	Complete
Four Gums bridge	Belowra Road, Belowra	Complete
Belowra bridge	Belowra Road, Belowra	Complete
Bradburys bridge	Araluen Road, Deua Valley	Complete
McGregors Creek bridge	Araluen Road, Deua Valley	Complete
Kennys Creek bridge	Araluen Road, Deua Valley	Complete
Pidgeon Gully bridge	Araluen Road, Deua Valley	Complete
Old Tomakin bridge	Old Tomakin Road, Mogo	Complete
Old Bolaro bridge	Old Bolaro Mountain Road, Buckenbowra	Complete

Table 1 – Bushfire and flood affected bridges

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Photo 13 – significant challenges face rural farmers and residents when critical infrastructure is lost. Belimbla bridge was destroyed on 31 December 2019. Temporary structures suffered repeated damage during subsequent repeat flood events

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Other Damaged Major Road Structures

In addition to the timber bridges numerous major culverts and causeways have been adversely impacted. A mixture of repair/replacement solutions is proposed depending upon the context, utilising a mixture of grants, disaster funding and Council bridge renewal funding.

Examples of major structures impacted include:

- a) Eurobodalla Road, Nerrigundah – northern causeway

This structure has been washed out at both ends repeatedly and will be replaced with a bridge with similar flood capacity to the bridge into Nerrigundah over Gulph Creek. This will provide vastly improved access to local residents and for Essential Energy to access the main powerline into Nerrigundah. The bridge components have been procured with installation scheduled for 2023, subject to confirmation of grant funding.



Photo 14 – Northern Gulph Creek Causeway, Eurobodalla Road, Nerrigundah

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b) Eurobodalla Road, Nerrigundah – southern causeway

This structure is located in a very wide section of Gulph Creek and would be a large exercise to replace with a bridge structure. The causeway will therefore be repaired in the interim and extended concrete approaches provided to mitigate loss of the roadway. This work is scheduled for 2023.



**Photo 15 – part of the southern causeway Gulph Creek Eurobodalla Road, Nerrigundah.
This photo highlights the devastating impact of both
the bushfires followed by a natural disaster flood event.**

c) Woila Creek causeway Belowra Road Belowra

This structure is on a significant creek and requires a short extension of the causeway either side to prevent wash-out. This work is scheduled for 2023.

d) Church Street, Mogo – causeway

This piped causeway was undermined in the December 2021 flood. This structure will be replaced with a larger box culvert structure reducing the frequency and time period residents will be cut off by floodwaters. This also reduces the potential risk to the community associated with risky driver behaviour. This project is scheduled for completion during 2022-23.

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e) Veitch Street, Mogo – major culvert

This structure was significantly damaged in the December 2021 flood, resulting in collapse of the road. Single lane access was quickly re-established that same night and a temporary repair affected shortly thereafter. Design solutions will be investigated during 2022-23 and funding sources identified.



Photo 16 Veitch Street, Mogo – culvert crossing December 2022 was restored that evening and re-opened to provide resident access. Major renewal/replacement will be required in the short term.

f) Buckenbowra Road culvert, Mogo

This structure required reconstruction being replaced by three 1050mm concrete pipes. This project is complete.

g) Araluen Road approximately 24km from Moruya - 1500m piped culvert

This damage was a combination of a batter collapse and headwall moving away from the road. Major construction was required. This project is complete.

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h) Nelligen Creek Road causeway

This piped causeway has been washed out in multiple events cutting access to rural residents and resulting in the loss of the road embankment and pavement materials into the nearby receiving waterways. This structure will be replaced with a bridge to improve resilience and overcome the challenges of repeat loss of the roadway. This work is scheduled to be undertaken in late 2023.



Photo 17 - Nelligen Creek Road causeway has been repeatedly washed away

i) River Road causeway (approximately 6.5km mark)

This causeway was severely damaged requiring reconstruction. The funding has been agreed and contracts let for the works.

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j) River Road, Nelligen

There are numerous legacy issues across the rural road network. This example highlights the lack of structures at key locations, inevitably resulting in the loss of the roadway during major events.

It is proposed to pursue grant funding to allow the NDRRA funding to be topped up to allow installation of a major culvert structure at this site. The road would also be lifted to mitigate flooding and the loss of the roadway to improve access for residents and environmental outcomes.



Photo 18 – River Road, Nelligen suffers regular flood damage

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Additional bridge construction

The replacement of additional timber bridges to improve resilience is being actively pursued. Such works are beyond the financial capacity of many regional councils, Eurobodalla included. Therefore, extensive advocacy work and the proactive pursuit of grant funding is essential.

Council has secured additional funding through the NSW Government Fixing Country Bridges Program and the Australian Government Local Roads and Community Infrastructure Program and Bridge Renewal Program to leverage the modest bridge renewal funding available to Council to facilitate the replacement and/or upgrade of the bridges shown in Table 2 below.

Bridge	Road & Location	Status
Garlandtown bridge	North Head Drive, Moruya	Complete
Codys bridge	Larrys Mountain Road, Moruya	Complete
Clarksons bridge	Wagonga Scenic Drive, Narooma	Bridge procured & contract let
Cobra bridge	Wagonga Scenic Drive, Narooma	Complete, approaches to be done
Cowdroys bridge	Wagonga Scenic Drive, Narooma	Complete, approaches to be done
Grumleys bridge	Wagonga Scenic Drive, Narooma	Bridge procured & contract let
Punkalla Ck bridge	Wagonga Scenic Drive, Narooma	Bridge procured & contract let
Potato Point bridge	Potato Point	In progress
Silo Farm bridge	Comerang Forest Road, Bodalla	In design, bridge procured
Tilba Tilba bridge	Corkhill Drive, Tilba Tilba	Bridge procured
Old Mill bridge	Old Mill Road, Turlingjah	Grant secured

Table 2 – Additional Bridge Replacements 2021-23

Clarksons bridge was damaged in the bushfires but saved from destruction in that event. This bridge is now being replaced with a new concrete bridge.

The replacement of these bridges is scheduled for completion by the end of 2023, subject to resourcing, contractor availability, bridge component supply and weather permitting.

As an example of the difference in resilience that can be achieved, an analysis was undertaken on the benefit to dairy farmers if the new Silo Farm bridge had been in place during the February 2022 floods. This low-level timber bridge goes underwater on a regular basis. Tuross River experiences large increases in flood height. The proposed replacement bridge has been designed to be lifted to the same height as the adjoining roadways (closer to riverbank height).

During the February 2022 modest flood event, the dairy farmers dropped almost 120,000 litres of milk on the ground over about a week, as they were unable to transport the milk to market in time. With the proposed new concrete bridge in place and with the good communication systems we already have in place, this could have been reduced to zero.

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Additionally, it is often not well appreciated, that staff often have to make high risk decisions to re-open the timber bridge when the floodwaters are still at deck level, to facilitate access for milk tankers, farmers and residents. This risk will be substantially less with a stronger concrete bridge, built to a higher less flood prone level. The new bridge will still flood in moderate to major events, as do long sections of the existing Eurobodalla Road.



Photo 19 – Silo Farm bridge on Comerang Forest Road, Bodalla goes underwater regularly isolating dairy farmers from milk transport. Typical scene when decisions need to be made about the safety of re-opening the bridge to milk tankers and farm vehicles.

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2. Water Supply and Sewerage Scheme Resilience

The Eurobodalla water supply is interconnected across Eurobodalla through a series of river offtakes, treatment facilities, pump stations and reservoirs.

The water supply reservoirs have sufficient capacity to service the towns, including during bushfire periods, noting most firefighting water for bushfires comes from other sources (eg rivers, dams and lakes).

Eurobodalla utilizes two main river offtakes being the Deua/Moruya River and the Tuross River. During periods of drought, we currently revert to supplying water across the whole of the serviced area from our Deep Creek Dam.

Our forward planning prepared for the Integrated Water Cycle Management Strategy demonstrated that Deep Creek Dam alone could not provide a secure water supply into the future.

The major challenges during the 2019-20 bushfires were due to the loss of power supply, making the movement of water from the north of Eurobodalla to the south difficult. Council's Water and Sewer, Workshop and Electrical teams worked around the clock to redirect water supply to the south and ultimately a decision was made to pump bulk water from the Moruya River to the south under a 'boil water' notice to ensure adequate supply in the midst of the disaster. At that time, the prediction was that the bushfire would run to the coast in just a few short hours, only four days after the New Year's eve bushfire holocaust.

Council had already planned to deliver the Eurobodalla Southern Water Supply but was yet to secure adequate funding for that purpose. A key element of our successful advocacy work was to improve the resilience for our community through provision of a second off-river storage as well as improving the resilience of supply to farmers in the Eurobodalla valley and for the environment.

Ultimately, Council secured \$25.612 million from the NSW Government and \$51.2 million from the Australian Government allowing the project to proceed without significant additional impost on local ratepayers. Further information can be found on Council's website at [Southern Water Supply Storage | Eurobodalla Council \(nsw.gov.au\)](https://www.eurobodalla.nsw.gov.au/Southern-Water-Supply-Storage).

The other key elements of water supply and sewerage scheme resilience are outlined under the Power Supply Resilience below.

3. Emergency Services Facilities

Eurobodalla regional collocated emergency service precinct - Moruya

The existing emergency services facilities for the Incident Management Team and Emergency Operations Centre during the 2019-20 bushfires were well below ideal. The existing RFS control centre was used for the IMT and the RSL hall for the EOC.

Council has advocated for some years prior to the bushfires for the provision of a Eurobodalla regional collocated emergency services precinct to be situated in Moruya, gaining strong

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support from the Local Emergency Management Committee and Regional Emergency Management Committee.

In early 2022, the Hon Stephanie Cooke MP, Minister for Emergency Services and Resilience, Minister for Flood Recovery, announced the provision of \$15m by the NSW Government to allow a new regional Rural Fire Service facility to be constructed in Moruya. This facility will house the State RFS, State RFS mitigation crews, regional office, Regional RFS office, Local RFS Fire Control offices, Incident Management Centre and Emergency Operations Centre.

The Australian Government has provided a grant of \$200,000 to allow the investigation work to be undertaken to identify an appropriate site.

Collaboration between the NSW Rural Fire Service, NSW Fire and Rescue and NSW State Emergency Service and Council is well advanced with a view to developing an overall masterplan to allow this regional collocated emergency services facility to be brought to reality.

The aim of this project is to provide a state-of-the-art regional emergency services precinct for our region and community. The regional facility will also employ significant permanent emergency services personnel within Eurobodalla with on-going benefits both from a disaster management and economic perspective.

A further \$5m was committed to this project by Federal Labor when elected. Discussions have already been held with our local member Fiona Phillips MP about the process of securing these funds to add to the \$15m already available. Further, NSW Labor have previously committed \$5m from the NSW Government if elected in March 2023.

Local Collocated RFS/SES Facility Surf Beach

The Batemans Bay SES building located at Council's Batemans Bay depot, was destroyed on 31 December 2019.

Council has worked with the SES and RFS and secured grant funding to help deliver a new collocated SES and RFS facility on the same site at Surf Beach next to the NSW Ambulance station.

This will provide new stations for the two emergency response agencies with some shared space, reducing the overall cost to the community.

This project will be delivered before the end of 2023.

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Photo 20 – Batemans Bay SES

Ember attack from the bushfires resulted in the existing SES building near Batemans Bay depot being destroyed on 31 December 2019. Much of the equipment had been relocated from the sheds before the bushfire hit.



Figure 3 – Design for collocated SES and RFS stations, Surf Beach

The new stations will be located immediately adjacent to the NSW Ambulance station.

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4. Power Supply Resilience

Essential Energy were represented by Liaison Officers in the Eurobodalla emergency operations centre (EOC) throughout the bushfire response. Their representatives and the Essential Energy field crews did an incredible job in extremely difficult and risky circumstances. Their actions during the response and recovery deserve high praise.

Eurobodalla is serviced by two 132kVA transmission lines from the north. Part of this line is managed by Endeavour Energy and the remainder by Essential Energy.

There is only very limited capability to supply mains power back to the very south of Eurobodalla.

During the 2019-20 bushfires, ‘flashovers’ over the main transmission lines from the intense bushfires and lightening triggered the automatic switch systems to shut down power to protect the lines from further damage. To re-energise the main transmission lines required extensive patrolling and inspection and review of the supply lines and sub-stations, and progressive switching back of power down the line from the north. These inspections were hampered by the intense bushfire and challenges associated with getting helicopters in the air and/or ground crews safely into the fire grounds.

Endeavour Energy and Essential Energy managed this component extremely well with good communications back to the EOC for broader dissemination to the community.



Photo 21 – Essential Energy Liaison Officer Jy Fraser briefing then Mayor Liz Innes and then member for Bega Andrew Constance with LEMO Warren Sharpe OAM on the power losses and program to restore power

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The more significant losses and greater risks came about due to the burning of timber power poles and associated electricity infrastructure.

Over 3,200 timber power poles burnt to the ground in New South Wales, many of them resulting in power lines strewn across roadways and private property. More than 2,000 of these pole losses were in the south-east of NSW, many of them in Eurobodalla. Essential Energy has about 1.4 million timber power poles in NSW.

Evacuating community members, first responders and Council teams were often faced with uncertainty about whether burning poles were about to fall and/or whether fallen lines were still live (noting the lines are presumed to be live until checked by Essential Energy).

The loss of power had a significant impact on the community including impacting the ability to store food, get fuel, provide for the wellbeing of residents within aged care facilities, and even simple things like recharging of mobile phones and computers.

It also had a major impact on the loss of critical infrastructure such as telecommunications, water and sewerage systems, telemetry systems and the ability to refuel firefighting equipment.

This required the gathering of fuel and constant resupply of generators for the hospitals, evacuation centres, emergency operations centre, incident management centre, Council, telecommunications sites, water and sewerage systems and the like.

Council's Workshop team gathered and distributed over 120,000 litres of fuel to supply generators and support the firefighting efforts during the 2019-20 bushfires with the help of local fuel companies, bus operators and transport companies.

One of the key motivators for taking action on power resilience is that our lived experience required sending people into high risk situations within the bushfire grounds in the response and early recovery phase. Although the risk was effectively managed, this can be avoided or significantly mitigated with improved resilience built into the system.

Under a state-owned corporation model, Essential Energy is not well positioned financially to renew recently replaced timber poles with more resilient options, without significantly impacting electricity pricing for all customers.

Council has therefore led advocacy, working closely with Essential Energy, for additional grant funding from the NSW and Australian Governments to improve the power resilience in the following high priority areas:

a) Mount Wandera telecommunications site

This site houses the Government radio network (GRN for all emergency services agencies), ABC and commercial radio and TV, Council's telemetry systems for water and sewerage systems and numerous private purposes.

Council has led a steering group of users of this site to develop an upgrade plan to deliver improved resilience for the whole site including:

- Provision of resilient power poles from the open farmland to Mt Wandera
- Replacement of vulnerable above ground electrical turrets and pole mounted transformers with more resilient installations

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- Improved power back-up onsite has been funded and is being implemented (Telco NSW are providing a 5 day back-up systems for the GRN and Telstra 2 days for telecommunications)
- Improved access and turning arrangements
- Improved Asset Protection Zones
- Improved resilience of Council's own installation.

Council led advocacy work with community associations and business chambers to Government in the lead up to the last federal election. This resulted in an election commitment from Fiona Phillips MP of \$750,000 for Mt Wandera resilience upgrades including power supply, access and asset protection zone improvements.



**Photo 22 – resilient power poles survived the intense bushfire at Merricumbene.
Broader application would significantly improve the resilience of the power supply network.**

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b) South Durras village

South Durras has no town water supply and is therefore more dependent on power than most villages, with the only supply in town being rainwater tanks.

The Durras Community Association showed strong leadership and Council partnered with them to advocate for the power line into South Durras to be upgraded to resilient power poles resulting in an election commitment from Fiona Phillips MP to provide \$243,000 in funding for the power line upgrade.

c) Power Supply to Critical Infrastructure

Advocacy work has commenced on improving power supply to critical infrastructure sites given the broader benefit to the whole of the community, to ensure more resilient outcomes for the future.

- Peak Alone telecommunications site

This site services both Eurobodalla Shire and Bega Valley Shire in the south.

Essential Energy has already replaced the power line to Peak Alone telecommunications site with resilient composite power poles. This was determined after assessing other potential stand-alone options, which were deemed to be less resilient.

- Water and sewerage installations

The main power lines to our Deep Creek water pump station and northern water treatment plant were destroyed in the bushfire and are likely to be destroyed again in future bushfires.

These facilities currently provide water to the whole of the Eurobodalla during times of drought.

Whilst Council did install temporary generators to service these facilities, this required staff to be onsite during the approaching bushfire and immediately after, as well as for the constant resupply for refueling for many weeks post the bushfire (when resources could have been directed elsewhere).

Council will provide permanent onsite generators to these sites with auto-switch over as part of our own resilience and continuity planning.

However, we have commenced negotiations with Essential Energy on the dual benefits to the whole of the community and the community in the immediate area serviced off this line, by upgrading the power lines to more resilient power poles through the bushland areas.

Similarly, as Council upgrades our water and sewer systems, onsite power generation with auto-switch over is being provided. This has already been progressed at the following sites:

- Bodalla sewerage treatment plant (complete)
- Bingie sewerage treatment plant (complete)
- Batemans Bay sewerage treatment plant (under construction)

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- Tomakin sewerage treatment plant (incorporated into the design of the upgrade)
- Moruya and Kianga sewerage treatment plants (to be incorporated into the next major refurbishment)
- Tuross sewage pump station no. 1 (incorporated into the design being progressed now)
- Batemans Bay sewage pump station no. 54 at Hanging Rock identified for upgrade
- Narooma sewage pump station no.1 in Field Street identified for upgrade
- Eurobodalla southern water treatment plant (to be incorporated with the new water treatment plant when completed in future year to provide increased resilience in the water supply from the new southern dam).

The remainder of the network is managed by mobile generators. Additional generators are made available during the peak summer period.

- Fuel service stations, major food retailers and aged care facilities

These facilities are required to service the majority of the community and/or our most vulnerable community members during natural disasters.

Many of these facilities require an upgrade to improve resilience during the loss of power and telecommunications. Through a mixture of direct action during the response and/or discussion with key parties since, some improvements have been made.

However, based on recent contacts, only a small proportion have taken significant action to improve resilience since the bushfires.

Advocacy to Government is required to pursue effective resilience improvement programs, potentially through a mixture of regulation, private investment and Government incentive programs.

In the case of aged care, Health NSW will continue to work with a view to improving resilience.

d) Future Power Pole Renewal and Relocation

Essential Energy has done extensive work looking to increase the ability to manufacture and supply resilient power poles across NSW.

As critical power lines are renewed by Essential Energy, it is anticipated timber poles will be replaced with more resilient options.

Council has also implemented a new practice whereby timber poles are replaced with more resilient power poles when undertaking our own infrastructure works.

We continue to explore advocacy work working with LGNSW and IPWEA NSW/ACT to develop a state-wide policy for cost sharing between councils and Essential Energy when this work is undertaken to mitigate the cost to local government.

To further support this activity, it is recommended that a motion be proposed to the next LGNSW conference (refer to recommendations in this report).

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5. Telecommunications

The loss of telecommunications during the bushfires was a major challenge. Although this is outside of Council's remit, Council has a role to advocate in this space.

Telstra met with Council during the response. Telstra prepared submissions to the Australian Government and secured limited funding for the hardening of infrastructure.

Approximately 85% of telecommunications losses sustained during the bushfires were due to power outages. Unfortunately, in Eurobodalla we also suffered significant physical damage to towers and installations due to the bushfires.

Across Eurobodalla, the power back-up at telecommunications towers and exchanges have been upgraded from 4hrs to 12hrs in most cases and more in the case of Mt Wandera.

Telstra continues to work with Council on the overall resilience of Mt Wandera and sees this as an example that can potentially be applied elsewhere. This is because the focus extends well beyond hardening of the infrastructure and back-up power systems to the overall site protections and resilience power supply to the site.

Telstra has also provided additional towers west of the Clyde Mountain and has agreed to provide an additional facility in Nerrigundah village.

Advocacy to the Australian Government to further improve the resilience and coverage of telecommunications needs to continue. This was included in the run-up to the recent election with advocacy work on improving coverage along the Princes Highway, particularly between Batemans Bay and Ulladulla.

6. Highway Resilience

The highways have been cut regularly during and since the bushfires.

Council has worked closely with Transport for NSW to undertake resilience improvements works on the Kings Highway including:

- Tree works on the Clyde Mountain
- Tree works west of Nelligen township
- Slope stability works on the Clyde Mountain.

Transport for NSW has undertaken resilience improvements on the Princes Highway. Additional works are needed, especially south of the Bermagui turnoff.

Council will continue to advocate directly to T4NSW and NSW Government and through SEATS for further resilience improvements to both highways.

Financial

The recovery works have been substantially funded through the Natural Disaster Relief and Recovery Arrangements. We are grateful for the level of support received from the NSW and Australian Governments.

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This has been supplemented where able from other grant funding programs such as the Local Roads and Community Infrastructure Program, Fixing Local Roads, Fixing Country Bridges and Council's existing programs.

Many other elements are the remit of the NSW and Australian Governments and/or private enterprise. Council continues to advocate for improved power resilience, telecommunications and other elements.

The inclusion of a motion to the upcoming LGNSW Conference is recommended to continue broader sector support.

Community and Stakeholder Engagement

Works will continue to recover Council's transport and other infrastructure. Ongoing community advice and engagement is undertaken aligned to this work.

Progress on the improved infrastructure resilience work and advocacy is reported in response to the Delivery Program and Operational Plan on a six monthly basis.

CONCLUSION

This report provides a high-level overview of the recovery and resilience of public roads, water, sewer and emergency services infrastructure. The report also provides a high-level overview of the advocacy work done to improve the resilience of power supply and telecommunications infrastructure.

The report also recommends a motion be placed before the LGNSW Conference to seek broader sector support for Council's advocacy work across the infrastructure space, to improve the resilience of fuel supply, food retail and aged care facilities and to improve emergency service arrangements in NSW.

Attachment A: Infrastructure Recovery – Natural Disasters – Bridges

Clarksons Bridge, Wagonga Scenic Drive, Narooma – Repair Complete



Photo A.1 Clarksons Bridge Wagonga Scenic Drive Narooma

This bridge was damaged in the bushfire and quickly assessed and repaired with new decking.

Grant funding has since been secured under the NSW Government Fixing Country Bridges Program to replace the timber bridge with a new concrete structure which is expected to be completed during 2022-23.

Grant funding was secured to replace all four other timber bridges along this route with new concrete bridges.

Rosedale Footbridge, Rosedale village – Repair Complete



Photo A.2 Rosedale footbridge post the 2019-20 bushfires



Photo A.3 Rosedale footbridge was replaced with a composite structure, in keeping with the surrounds, to reconnect the heavily impacted North and South Rosedale villages

Cheese Factory Bridge, Eurobodalla Road, Eurobodalla - Complete



Photo A.4 Cheese Factory bridge – normally ‘permanently’ wet waterways were dry completely when the bushfires hit on 31 December 2019.



Photo A.5 – Cheese Factory bridge was replaced with a new concrete bridge

Reedy Creek Bridge, Eurobodalla Road, Cadgee - Complete



Photo A.6 – Reedy Creek bridge was completely destroyed during the bushfires requiring multiple temporary crossing structures to be built and rebuilt due to flooding damage prior to completion of the new concrete bridge



Photo A.7 – Reedy Creek bridge – a new concrete bridge is now in place and the approaches have since been sealed to reduce sediment loads into nearby waterways and better care for the new bridge

Peach Tree Bridge, Eurobodalla Road, Cadgee - Complete



Photo A.8 Peach Tree bridge – destroyed during the 2019-20 bushfires on 31 December 2019



Photo A.9 – Peach Tree bridge – a new concrete bridge is now in place with sealed approaches

Murphys Bridge, Eurobodalla Road, Cadgee – Open to Traffic



Photo A.10 – Murphys bridge 31 December 2019 during the bushfires
(photo courtesy of local residents).

Council crews cut the girders on this deck on the same day to save a portion of the bridge timber.



Photo A.11 – Murphys bridge Eurobodalla Road Cadgee was the largest of the bushfire affected bridges to be replaced. Regular flooding of the Tuross River kept the contractor off-site, increasing the time required to replace the bridge making reconnection of the community during recovery more difficult. Alternate transport routes were maintained throughout despite many challenges with flood damage (loss of pavement, landslides and slope instability).



Photo A.12 – Murphys bridge Eurobodalla Road Cadgee – new 68.5m long concrete bridge re-opened to local traffic and school buses on 25 August 2022. Further work is to be undertaken on the bridge approaches for larger vehicles

Sinclairs Bridge, Eurobodalla Road, Cadgee - Complete



Photo A.13 – Sinclairs bridge

The bridge was temporarily repaired to allow traffic to continue use until replacement could be arranged



Photo A.14 – Sinclairs bridge

New concrete bridge in place. The road approaches will be sealed in late 2022 including linking the seal at Cadgee bridge to Sinclairs bridge

Gulph Creek Bridge, Nerrigundah Mountain Road, Nerrigundah - Complete



Photo A.15 – Gulph Creek bridge

The bridge suffered significant damage during the bushfires. Temporary repairs were undertaken to keep local traffic able to access Nerrigundah village



Photo A.16 – Gulph Creek bridge

Following the bushfires, floods washed huge volumes for burnt timber and debris onto the temporary structure. This was removed, mulched and provided to Forestry NSW for environmental restoration work as part of the recovery effort.



Photo A.17 – Gulph Creek bridge

The completed concrete bridge. This was the first 18.5m long single span Inquik bridge installed in Australia.



Photo A.18 – Nerrigundah village

To assist the bushfire devastated community, the access roads within the village were sealed. Council worked with the Rural Fire Services to secure a grant from the Commonwealth bank which facilitated the construction of a picnic facility and BBQ area for the community next to the RFS shed.

Comans Bridge, Gulph Creek Road, Nerrigundah - Complete



Photo A.19 – Comans bridge

The timber bridge was completely destroyed in the bushfires.



Photo A.20 – Comans bridge

The timber bridge was replaced by multiple concrete box culverts

Belimbla Bridge, Belowra Road, Belowra - Complete



Photo A.21 – Belimbla bridge

Normally a flowing creek, the river was dry when the 2019-20 bushfire burnt the timber bridge.



Photo A.22 – Belimbla bridge

The February 2020 and subsequent floods washed temporary access arrangements away and resulted in huge quantities of ash, sediment and timber being washed into Belimbla Creek and the immediately adjoining Tuross River



Photo A.23 – Belimbla bridge

Smaller temporary timber bridge structures were installed to provide access.
Repeat floods made retention of access to Belowra challenging



Photo A.24 – Belimbla bridge

The new concrete bridge now in place

Sitters Ditch Bridge, Belowra Road, Belowra - Complete



Photo A.25 – Sitters Ditch bridge
The bridge was destroyed on 31 December 2019



Photo A.26 – Sitters Ditch bridge
The bridge was replaced with a multiple cell concrete culvert

Four Gums Bridge, Belowra Road, Belowra - Complete



Photo A.27 – Four Gums bridge
The bridge was destroyed on 31 December 2019



Photo A.28 – Four Gums bridge
The bridge was replaced with a multiple cell concrete culvert

Belowra Bridge, Belowra Road, Belowra - Complete



Photo A.29 – Belowra bridge
The bridge was burnt on 31 December 2019



Photo A.30 – Belowra bridge
Temporary access structures were repeatedly damaged by subsequent flood events



Photo A.31 – Belowra bridge

The new concrete bridge is now in place providing a resilience solution for the future

Bradburys Bridge, Araluen Road, Deua Valley - Complete



Photo A.32 – Bradburys bridge

The existing timber bridge suffered significant damage in the July 2020 floods following the bushfires.



Photo A.33 – Bradburys bridge

A new concrete bridge has been provided.

McGregors Creek Bridge, Araluen Road, Deua Valley - Complete



Photo A.34 – McGregors Creek bridge

The bushfires caused significant damage to the bridge in January 2020



Photo A.35 – McGregors Creek bridge

A new concrete bridge has been provided

Kennys Creek Bridge, Araluen Road, Deua Valley - Complete



Photo A.36 – Kennys Creek bridge

The timber bridge suffered extensive damage in the January 2020 bushfires. Temporary repairs were provided to maintain access until the new bridge was completed.



Photo A.37 – Kennys Creek bridge

A new concrete bridge has been provided and open to traffic. Works are still required to remove the old bridge and restore the site

Pigeon Gully Bridge, Araluen Road, Deua Valley - Complete



Photo A.38 – Pigeon Gully bridge

The timber bridge was burnt during the January 2020 bushfires



Photo A.39 – Pigeon Gully bridge

A new multi-cell concrete box culvert was installed to replace the bridge. The box culverts were available locally from Transport for NSW which facilitated a faster outcome at this site

Old Tomakin Road Bridge, Old Tomakin Road, Mogo – Complete



Photo A.40 – Old Tomakin Road bridge

The timber bridge was burnt on 31 December 2019



Photo A.41 – Old Tomakin Road bridge

The bridge was replaced with a concrete box culvert

Old Bolaro Bridge, Old Bolaro Mountain Road, Buckenbowra - Complete



Photo A.42 – Old Bolaro bridge

The bridge was burnt on 31 December 2019



Photo A.43 – Old Bolaro bridge

This site was difficult to access so the bridge was designed as a composite steel and concrete bridge structure. The concrete for the bridge had to be hand mixed on-site with the work completed by Council's crews.