Hampden Bridge (Kangaroo Valley)

“A Bridge for Eternity”

REPAIR • STRENGTHEN • 42.5 TONNES BY CHRISTMAS 2027

A COMMUNITY GUIDE AND HANDBOOK

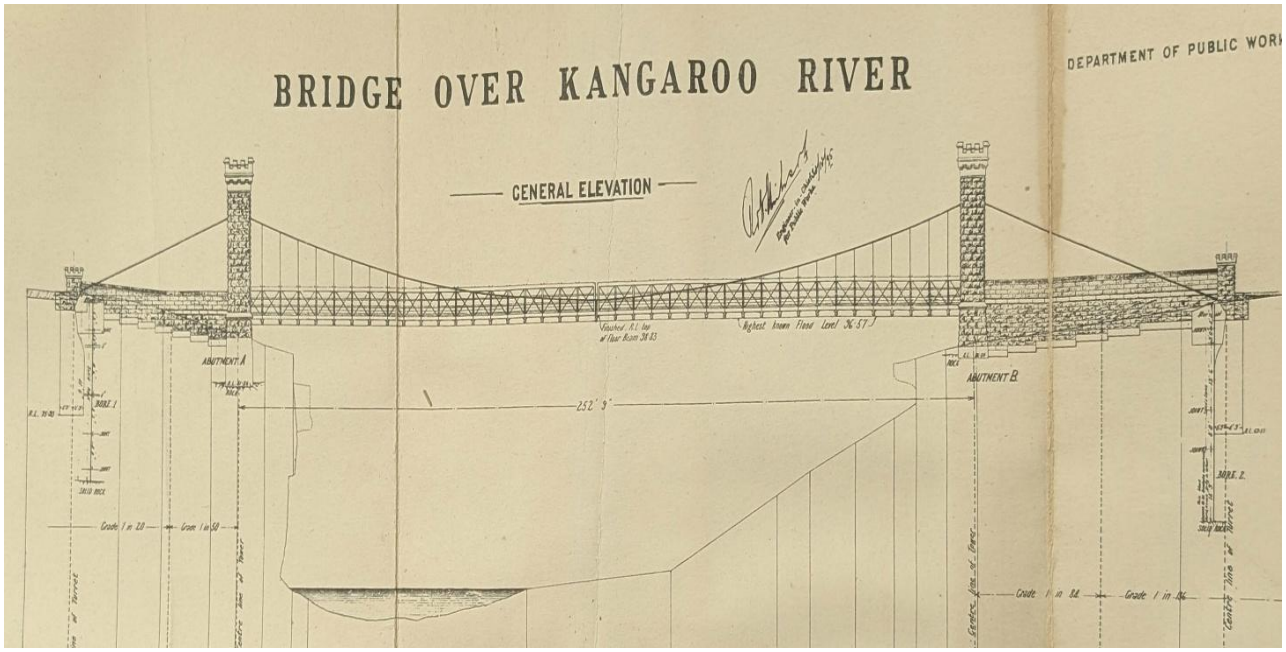

Image 1 Bridge Over Kangaroo River, 1895, Department of Public Works, NSW, Mitchell Library, Q624.23/1 The Mitchell Library copy of the original drawings was owned by Kangaroo Valley’s pioneering farmer E.S. Scott of Upper River who probably worked as a contractor during construction.

16th Edition

This report can be downloaded free at this link:
https://www.workingpapers.com.au/papers/hampden-bridge-kangaroo-valley-%E2%80%9C-bridge-eternity%E2%80%9D#/

All comments are welcomed and may be posted to Friends of Hampden Bridge

19 March, 2026

"The Hampden Bridge, Kangaroo Valley is recognised by the engineering fraternity as the most historically significant bridge in Australia, after the Sydney Harbour Bridge. It is the last remaining example of a major timber suspension bridge still in operation in Australia. It is an iconic, historic structure well worthy of full heritage listing, on the national register and must be fully preserved in its original state as a working structure, both now and for future generations"

Bruce Ramsay, *"Why Hampden Bridge Is in Urgent Need of Repair."* Kangaroo Valley Voice 2010, June edition.

I Table of Content

II Preface to the 15th Edition

In 2025 *Transport for NSW* released a draft Regional Integrated Transport Strategy (T. f. NSW *Draft Illawarra Shoalhaven, Strategic Regional Integrated Transport Plan*) for public comment.

As part of its objective to provide

- a safe road network,
- to create a thriving and diversifying economy and
- in order to create a resilient transport network

It was also announced that Transport for NSW want to progress freight capacity upgrades for Hampden Bridge, Kangaroo Valley, first, by progressing the immediate installation of a temporary bridge and second, by planning for a long-term solution to provide 42.5 tonne vehicle load limit on the Illawarra Highway over Kangaroo River at Kangaroo Valley. (T. f. NSW *Draft Illawarra Shoalhaven, Strategic Regional Integrated Transport Plan*)

The NSW government invited comment by February 9, 2026[1]

The first iteration of this report provided feedback to the draft regional integrated transport strategy. Over the December 25/January 26 period comments by community and regional Shoalhaven and Illawarra residents were invited through the facebook page **Hampden Bridge: "A Bridge for Eternity"** and through many discussions and consultations. Each part of this report was released in draft form beginning with an historical account of how Hampden Bridge was built in 1898: "A Bridge for Eternity" released in November 2025 at this link: A Bridge for Eternity

The Report went through 12 editions, each new version entailing corrections and feedback from the community. In putting together "the report" it was expected that this process would go on *ad infinitum* as more and more people appreciated the elegance and importance of what de Burgh labelled simply "the bridge over the Kangaroo River". This has proved to be the case.

This Report submitted to Transport NSW examined

- the cost benefits of the various freight upgrade options,
- the unique heritage of Hampden Bridge including many new historical findings,
- the economic/social/environmental dimensions of the road system,
- the community and population needs,
- our growing and diverse economy as well as the local and regional population pressures and needs.

The Hampden Bridge Master Report, 13th Edition, February 2026 was a detailed response to the draft transport strategy, focusing on preserving and upgrading Hampden Bridge while emphasizing heritage, sustainability, and regional connectivity. The last Regional Transport Plan (released March 2021) outlines 71 initiatives. It does not mention Hampden Bridge or Kangaroo Valley. However, it includes several related initiatives that align partially with the Hampden Bridge Report recommendations (e.g., road safety, freight diversion via rail, and alternative

[1] Community members can view the draft Plan and provide comment until Monday, 9 February 2026 at **www.haveyoursay.nsw.gov.au/sritp/illawarra-shoalhaven**

routes like Nerriga Road). Below is a dot-point comparison, structured by key themes showing what the Hampden Bridge Report proposes vs. what appears in the 2021 plan.

1. Hampden Bridge Upgrades and Preservation

- **Hampden Bridge Report**: Proposed a phased in-situ strengthening program to restore 42.5-tonne Higher Mass Limits (HML) capacity by Christmas 2027 (Phases 1-3: stabilization, suspension reinforcement, resilience enhancements like FRP deck and seismic upgrades). Emphasized no replacement or temporary bridge, with a BCR of 12-25:1, heritage-compliant pedestrian/cycle path, and a 50-year Heritage Asset Management Plan & Maintenance Endowment (~$18M seeded fund).
- **Transport NSW**: No specific initiative for Hampden Bridge repairs, strengthening, or replacement. The plan focused on broader road network improvements, but related items include Item 21 (Moss Vale Road, Princes Highway, and Cambewarra Road Intersection Improvements - in planning, own responsibility), which could indirectly support access around Kangaroo Valley. No mention of heritage trusts, pedestrian paths, or dedicated funding for the bridge.

2. Freight Capacity and Diversion Strategies

- **Hampden Bridge Report**: Advocates diverting heavy freight (≥45.2 tonnes) from B73/MVR271 to the Unanderra-Moss Vale rail line by 2030 (e.g., bulk commodities and livestock via Queensland's Cattle Train model), with BCR 3-4:1 and $100-200M net benefits over 20 years. Also supported completing Nerriga Road upgrades to 42.5t HML by 2030 to divert 30-40% of east-west freight, reducing pressure on mountain passes and Hampden Bridge.
- **Transport NSW**: Partial alignment—Item 71 (Moss Vale to Unanderra Line and Coniston Junction Rail Improvements - for investigation, own responsibility) supports rail enhancements for freight (and potentially passengers), echoing your rail diversion idea. Item 36 (HPV Access for MR92 Nerriga Road between Nowra and Braidwood - for investigation, own responsibility) directly adopts the Nerriga upgrade for heavy vehicle access, which could reduce freight on B73. No explicit commitment to full freight diversion timelines or livestock-specific models.

3.Road Safety and Reliability in Kangaroo Valley Region

- **Hampden Bridge Report**: Highlights sustainable roads, including repairs to mountain passes (Barrengarry vs. Cambewarra vs. Macquarie Pass), risks from floods/landslips, and need for permanent maintenance teams. Recommended Illawarra Highway/Macquarie Pass safety tech (e.g., for heavy vehicles) and overall B73/MVR271 resilience.
- **Transport NSW**: Addresses regional road safety broadly—Item 40 (Illawarra Highway Safety and Reliability Improvements - for investigation, own responsibility) aligns with Macquarie Pass concerns. Item 38 (Identify opportunities for technology to improve heavy vehicle safety on Macquarie Pass - for investigation, own responsibility) specifically matches your tech-driven solutions. Item 34 (Establish guidance for roadside vegetation management to improve bushfire resilience - for investigation, own responsibility) supports resilience against natural disasters, similar to your

flood/bushfire emphasis. No mention of permanent maintenance teams or specific B73 focus.

4.Heritage, Economic, and Community Impacts

- **Hampden Bridge Report**: Emphasizes Hampden Bridge's heritage protections (State Heritage Register #01469), economic benefits (e.g., tourism, jobs from upgrades—44-55 FTE across phases), and community needs (e.g., no closures, pedestrian/cycle path with 92% support). Argued for a Conservation Management Plan (CMP) and trust to prevent neglect, integrating with regional economy (e.g., dairy, tourism).

- **Transport NSW**: No direct heritage or bridge-specific economic initiatives. Broader alignment includes Item 62 (Work with Local Government, DPIE, and industry to ensure regionally significant growth areas support walking and cycle-friendly neighbourhoods - for investigation, collaborate), which could support a pedestrian/cycle path indirectly. Item 67 (Work with NSW Department of Education, Catholic Schools NSW, and Local Government to address barriers to walking and cycling to school - for investigation, collaborate) promotes active transport. Tourism/economic growth is mentioned in the vision (e.g., productive theme), but not tied to Hampden Bridge.

5. Sustainability and Low-Emissions Transition

- **Hampden Bridge Report**: Supports regional shift to low-emissions (e.g., EV parity by 2024), rail for sustainability, and resilience packages (e.g., scour protection, dampers) for 100+ year bridge life.

- **Transport NSW**: Strong focus on sustainability—Item 25 (Work with DPIE, DRNSW, and industry to develop an EV Fast Charging Network - in planning, collaborate) and Item 61 (Work with DPIE, DRNSW, and industry to develop a hydrogen refuelling station network for heavy vehicles - for investigation, collaborate) align with your low-emissions push. Item 54 (Transition Transport for NSW passenger fleet to 70% low emission and 20% battery electric or hydrogen by 2025 - for investigation, own) and Item 55 (Transition bus fleet to 100% zero emission - for investigation, own) support fleet transitions. Rail improvements (Item 71) aid sustainable freight.

Overall Observations

- **Adopted Elements**: The 2021 plan incorporates some of the Hampden Bridge Report's broader recommendations (e.g., rail upgrades, Nerriga diversion, safety tech on passes), suggesting influence on regional freight and resilience strategies. No worst-case outcomes like a temporary bridge or full replacement are listed.

- **Omitted Elements**: Direct action on Hampden Bridge (e.g., strengthening to 42.5t, heritage trust) is absent.

- The 2021 Transport NSW plan prioritizes investigations within 10 years, Items 21, 36, 40, 71 are effectively addressed by the Hampden Bridge Report.

On all grounds, including cost benefits, the overwhelming evidence presented to Transport NSW is that Hampden Bridge should be maintained as the central and only bridge over the Kangaroo River (certainly at the original Moss Vale crossing site) with a 42.5 tonnes weight capacity. To guarantee the viability of this strategy, it is argued that a heritage and maintenance trust for Hampden Bridge should be established. This would guarantee Hampden Bridge as the most appropriate and sustainable working centre of the MVR271/B73 road system for another 127 years.[2]

In this edition of the Hampden Bridge Report we have added a chapter on the heritage protections which we have grown to understand better since first beginning to research Hampden Bridge. Hampden Bridge is protected by its listing as one of the highest priority NSW Heritage items. This listing occurred in 2019. It creates an important framework for the Kangaroo Valley and larger NSW community to understand Hampden Bridge's unique place in our history. It also creates a foundation stone for the community to draw from and improve over coming decades.

This report will be updated regularly

In the short term (March–September 2026): Friends of Hampden Bridge will:

- The Hampden Bridge Report addresses Track Item 21 (Moss Vale Road, Princes Highway, and Cambewarra Road Intersection Improvements – in planning, TfNSW "own" responsibility). Hampden Bridge is on Moss Vale Road so this ties into broader route resilience (e.g., flood/landslip risks). We use TfNSW's website (transport.nsw.gov.au) and subscribe to their project newsletters for quarterly reports.
- The Hampden Bridge Report addresses Item 36 (HPV Access for MR92 Nerriga Road between Nowra and Braidwood – for investigation, "own"). The Report argues that 30-40% of east-west freight could be diverted from B73/Moss Vale Road, reducing bridge pressure—aligning with rail/freight diversion ideas.
- The Hampden Bridge Report addresses Item 38 (Opportunities for technology to improve heavy vehicle safety and Item 40 (Illawarra Highway Safety and Reliability Improvements – for investigation). It is argued these must extend to nearby passes like Barrengarry/Cambewarra, supporting sustainable roads emphasis. It is recommended that Kangaroo Valley Residents sign up to receive the Live Traffic NSW app or TfNSW's safety programs.
- The Hampden Bridge Report prioritises Item 71 (Moss Vale to Unanderra Line and Coniston Junction Rail Improvements – for investigation, "own"). This

[2] All calculations of costs and benefits in this report were *best estimates* based on benchmarks, standard government infrastructure calculations and recommendations, past projects, public statements by NSW Government departments, Federal government departments, Shoalhaven City Council and other public instrumentalities. The report recognises that costs and estimates are subject to an infinite number of variables and interpretations. In presenting current, future and historical costs the aim is to create a starting point that can empower community members to start a dialogue that will enable them to question and compare the costs of different options and to more exactly examine presentations by public authorities. In this regard all dialogue with professional engineers, actuaries and government representatives is welcomed.

directly supports Unanderra-Moss Vale rail freight diversion proposal (e.g., for bulk/livestock). Review ARTC's (Australian Rail Track Corporation) updates, as they manage the line.

- **The Friends of Hampden Bridge address TfNSW Directly** through reference group meetings and other meetings.
- **T**his edition of the Hampden Bridge Report includes an additional chapter highlighting Hampden Bridge's State Heritage Register status (#01469) and how it aligns with the plan's resilience objectives (e.g., Objective 3 on technology for network resilience, page 58).

Medium-Term Steps (October 2026–September 2027): Advocate During Investigations

- **The Friends of Hampden Bridge are continuing to engage with Transport NSW and other bodies over the medium to long term.** As investigations begin (plan commits to starting within 10 years, but many are slated for 0-5 years), submit feedback emphasizing Hampden Bridge. For example:
    - Item 71's rail study, push for freight diversion modeling (e.g., adapting Queensland's Cattle Train for livestock), calculating BCRs from report (3-4:1 over 20 years).
    - Item 40's Illawarra Highway review, advocate extending safety tech (e.g., AI cameras, sensors) to Moss Vale Road, including bridge monitoring (IoT sensors from the Hampden Bridge Phase 3 proposal).
    - Link to broader sustainability: Tie into Items 54-55 (fleet transitions to low-emissions) by proposing EV charging at bridge precincts.
- **Secure Funding and Partnerships**: Apply for grants under Federal Active Travel programs (e.g., for pedestrian/cycle path) or NSW Heritage grants for proposed maintenance endowment (~$18M). Collaborate with DPIE (Department of Planning and Environment) on Items 59-60 (SIC-funded infrastructure for growth areas), arguing Kangaroo Valley's tourism/economic role.
- **Media and Public Campaign**: Highlight Transport NSW omissions, sharing visuals from this report (e.g., historical photos of Hampden Bridge). Aim for pro Hampden Bridge op-eds tying the bridge to the Regional plan's vision goals (e.g., 20% active/public transport trips by 2041, page 4).
- **Assess TfNSW's 2026 Repair Works**: By late 2026, evaluate the beam/hanger replacements lobby for expansion into full strengthening (Phases 1-3), using the plan's "adaptive and sustainable" theme. This involves engaging with a group of consultative engineers willing to support Hampden Bridge as a long term and important transport initiative.

Long-Term Steps (October 2027 Onward): Push for Plan Updates and Resilience

- **Influence Future Reviews**: The 2021 plan was a "blueprint" under Future Transport 2056, with potential updates every 5-10 years. The Hampden Bridge Report is effectively a future blueprint with community support (92% for pedestrian path) and economic

benefits (e.g., tourism jobs from your report). Continually revise the Hampden Bridge Report with more information.

- **Build Regional Alliances**: Partner with groups in Nowra-Bomaderry or Shellharbour (e.g., via Items 1, 29) to advocate for interconnected upgrades, including rail (Item 47: Maldon-Dombarton) as a complement to Unanderra-Moss Vale.
- **Monitor Outcomes and Adapt**: Track BCRs and progress via annual TfNSW reports. If items stall, escalate to the Minister for Regional Roadsor initiate a community inquiry, referencing the plan's commitment to proactive delivery.
- **Sustain Heritage Focus**: Establish a local trust or CMP (Conservation Management Plan) independently if needed, using the Hampden Bridge report's framework to ensure the bridge's "eternity" aligns with the plan's low-emissions future (e.g., EV/hydrogen networks, Items 25, 61).

This 16th edition also incorporates comments by an expert group who have kindly offered to review the recommendations we have put forward for repairs and strengthening of Hampden Bridge. Their full commentary appears on p213 as Appendix 21 Engineering Comments on the Hampden Bridge Report (8 February 2026). In addition several tables and costings have been adjusted to take into account these welcome and constructive ideas and suggestions.

Hampden Bridge Group of Researchers and Supporters

March 19, 2026

III Executive Summary

Hampden Bridge (1898), Australia's only surviving de Burgh-designed road-bearing suspension bridge and a State Heritage Register icon, remains structurally capable of being fully strengthened and legally restored to 42.5 tonne Higher Mass Limits (HML) capacity by Christmas 2027. This phased, in-situ programme — building directly on Transport for NSW's confirmed 2026 beam and hanger replacement works — delivers the highest benefit–cost ratio (conservatively 12–25:1 over 20 years) of any Kangaroo River crossing option currently under consideration, with minimal daytime disruption (night/off-peak works only) and zero permanent visual or heritage impact on the fragile canoeing, walking and tourism precinct.

A long-term resilience package (Phase 3: FRP deck overlay, scour protection, fluid viscous dampers, seismic base isolators) would extend design life beyond 100 years and lift overall BCR above 15:1. A fully separated, heritage-compliant dedicated pedestrian and cycle path — the community's highest priority (92% support, Shoalhaven City Council 2025) — can be added in Phase 4 using Federal Active Travel grants and Shoalhaven allocations, with no impact on the core strengthening budget.

Even the maximum realistic spend on strengthening, resilience upgrades, pedestrian/cycle path **and** a fully funded, legislated 50-year Heritage Asset Management Plan & Maintenance Endowment (seeded with ~$18 million, invested at 5% real return to generate ~$900,000 per annum in perpetuity) is still less than one-third the $180–220 million required for a temporary modular bridge followed by a permanent concrete dual-carriageway replacement (Aitchison, 2025; TfNSW internal estimates).

To guarantee the bridge is never again allowed to deteriorate to crisis point, the project must include this endowment — modelled on the successful Sydney Harbour Bridge and Hawkesbury River rail bridge trusts — established under the NSW Heritage Act with joint TfNSW/Heritage NSW oversight, annual public reporting, and permanent Community Reference Group statutory input.

Complementary to strengthening, a future-oriented regional transport strategy is the progressive diversion of all through heavy freight (≥45.2 tonnes) from B73/MVR271 to the existing Unanderra–Moss Vale rail line by 2030. This aligns with NSW Freight Policy Reform, complements the Nerriga Road upgrade (diverting 30–40% east–west freight), and removes 200–300 heavy vehicles per week from the network, significantly extending pavement life and reducing landslip risk on the vulnerable mountain passes. Feasibility is high for bulk commodities and medium for livestock (adapting Queensland's Cattle Train model), with BCR 3–4:1 and net benefits of $100–200 million over 20 years.

No replacement. No full closure. No repeat of neglect. No excuse.

Recommendation Immediately approve funding for the in-situ strengthening programme to deliver legal 42.5 t HML capacity by Christmas 2027, establish the 50-year Heritage Asset Management Plan and Maintenance Endowment concurrently, reserve contingent funding for resilience upgrades and the pedestrian/cycle path as grants become available, formally abandon temporary modular bridge and new concrete replacement options, accelerate Nerriga Road to full 42.5 t HML by 2030, and advance Unanderra–Moss Vale rail freight diversion (with passenger service exploration) as the sustainable long-term regional complement.

IV Key Findings

1. Hampden Bridge is structurally sound and can be restored to full 42.5 t HML by December 2027 — the cheapest, fastest and highest-return project currently before the NSW Government. The Minns Labor Government's commitment to "urgent repair" and "essential maintenance to keep the bridge safe" confirms in-situ strengthening as the short-term priority, with TfNSW's 2026 works (12 bottom truss beams, 9 top truss beams, 11 hanger bars) aligning directly with Phase 1 of the advocated programme.
2. The original de Burgh safety factor of not less than 6–7 (de Burgh 1895) deliberately over-engineered the structure 'for eternity'; targeted modern interventions (cable augmentation, hanger replacement, FRP deck, seismic damping) can achieve 50–100+ year life extension while preserving 100% heritage fabric.
3. In the 2022 and 2024 floods — when both mountain passes were closed for months and every sub-arterial suffered major landslips — Hampden Bridge never closed and never faltered, proving it is the Valley's only reliable flood-resilient crossing.
4. The sustainability of the B73/MV271 Road System and ancillary roads in Kangaroo Valley Transport NSW was compromised by the loss of a permanent road maintenance team based at the main roads site at Bendeela Rd, Kangaroo Valley. Similarly the integrity of Hampden Bridge was compromised by only temporary maintenance crew after
5. The single-lane "pause" remains the primary traffic-calming device protecting the B73/MVR271 road system, village character, school, showground, recreational facilities and quiet back-lanes.
6. Completion of the Nerriga Road upgrade to 42.5 t HML by 2030 will permanently divert 30–40% of east–west through-freight; full diversion of remaining heavy through freight (≥45.2 t) to the Unanderra–Moss Vale rail line is feasible and complementary, with high BCR and major pavement/emissions/safety savings.
7. Every comparable de Burgh-era or State-heritage-listed suspension/truss bridge in NSW has been successfully strengthened in-situ with zero demolitions (Pyrmont, Peats Ferry, Roseville, Tooleybuc, Barham-Koondrook); Hampden Bridge is the logical next project in this proven NSW programme.
8. Community consensus is overwhelming: the great majority of Kangaroo Valley residents support and demand retention, strengthening and long-term trust governance of the existing Hampden bridge (Shoalhaven City Council 2025 consultations).

V Recommendations

1. Immediately approve funding for the in-situ strengthening programme (Phases 1–2) to deliver legal 42.5 t HML capacity by Christmas 2027 with no daytime closure. (Minns Government)
2. Commit in principle to the full resilience and seismic retrofit package (Phase 3) for delivery 2030–2032. (Minns Government)
3. In order to foster the sustainability of the B73/MV271 Road System and ancillary roads in Kangaroo Valley Transport NSW should reinstate a permanent road maintenance team based at the main roads site at Bendeela Rd, Kangaroo Valley. In addition, a permanent heritage bridge maintenance team should be based at Hampden Bridge with a remit to support other older bridge maintenance throughout NSW.
4. Establish, under the NSW Heritage Act, a fully funded 50-year Heritage Asset Management Plan and Maintenance Endowment seeded with $18 million.(Minns Government/Federal Government)
5. Formally abandon all temporary modular military-style bridge and new concrete replacement options.(Transport NSW)
6. Accelerate the Nerriga Road / Oallen Ford upgrade to full 42.5 t HML sealing by 2030.(Transport NSW)
7. Advance the Unanderra–Moss Vale rail line as the future-oriented option for full diversion of heavy through freight (≥45.2 t), with exploration of passenger service revival.(Transport NSW, State Rail, Minns Government, Private Transport Industry)
8. Fund and construct a heritage-compliant dedicated pedestrian/cycle walkway using existing Federal Active Travel and Saving Our Icons grants. (Federal Government)
9. Create a permanent Community Reference Group with statutory oversight of the Heritage Plan maintenance program and annual public reporting.(Kangaroo Valley Community)
10. Mark the 130th anniversary in 2028 with the official reopening ceremony at full 42.5 t capacity.(Kangaroo Valley Community)

VI Gallery of Historical Photographs

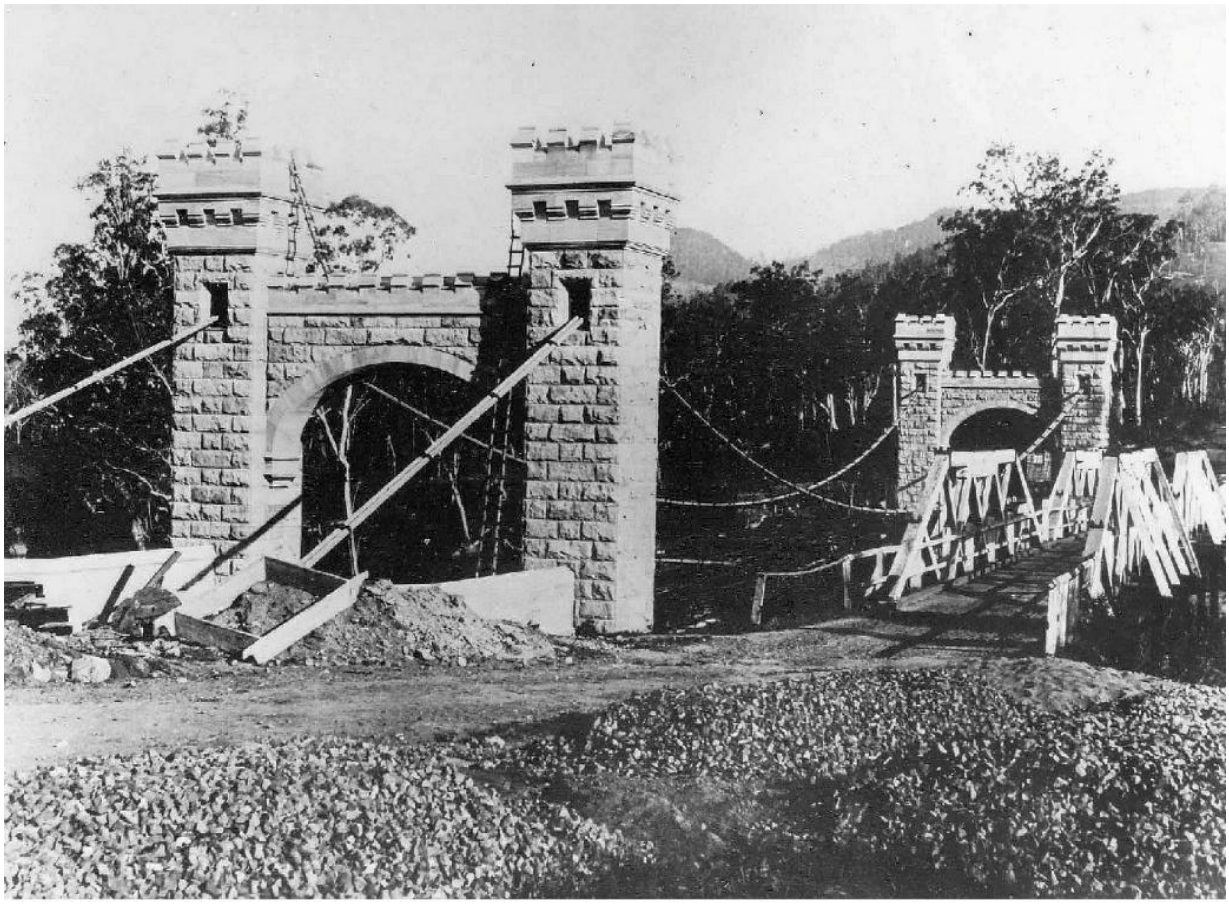

Image 2 A Rare Photo of Hampden Bridge being constructed with the Original Bridge (soon to be washed away) alongside c 1897

*Image 3 One of the earliest photos of Hampden Bridge circa 1899/1900 Album 24: Photographs of the Allen family, 14 November 1899 - 4 November 1900, PX*D 569, 26l4xBq4GPr23*

Image 4 Kangaroo Valley, suspension bridge, 8/1906, Government Printing Office 1 - 32132, Original negative held by State Archives & Records Authority of New South Wales. ***SLNSW*** *YRlMr0ln, 204181*

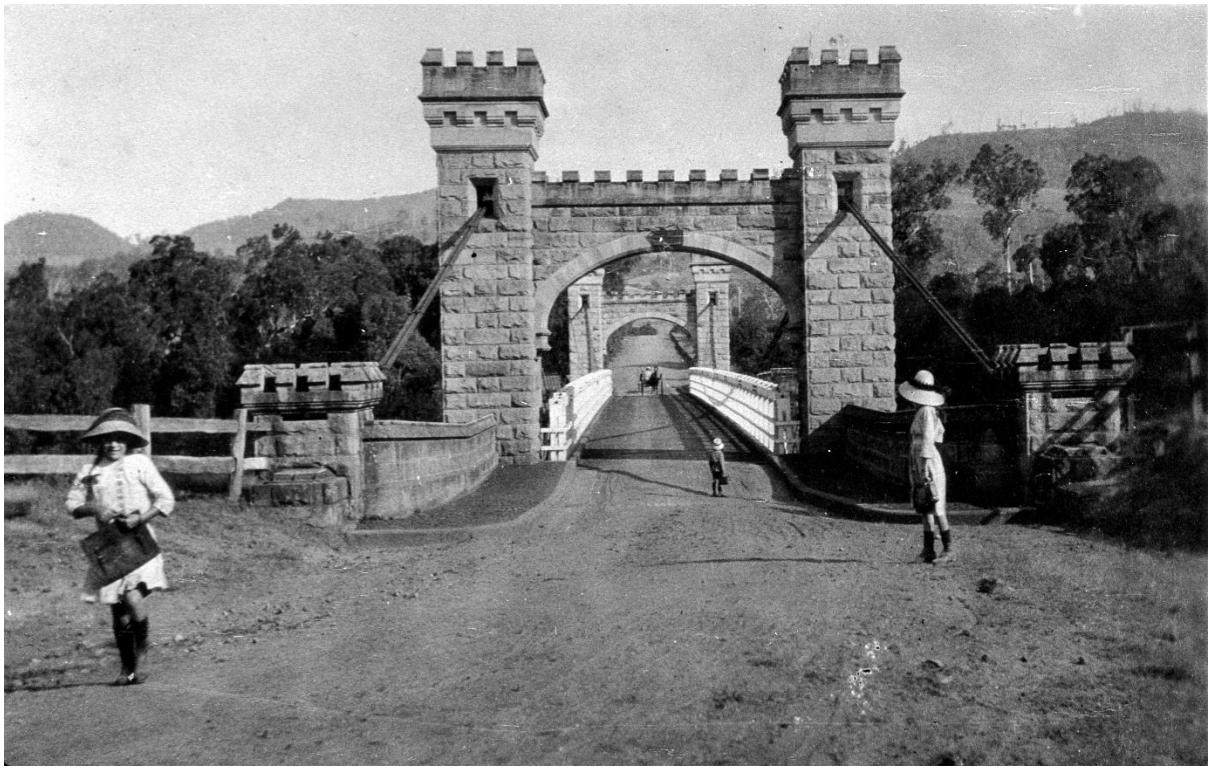

Image 5 Hampden Bridge, Suspension bridge - Kangaroo Valley, NSW, c 1910, SLNSW nQRBvNA1

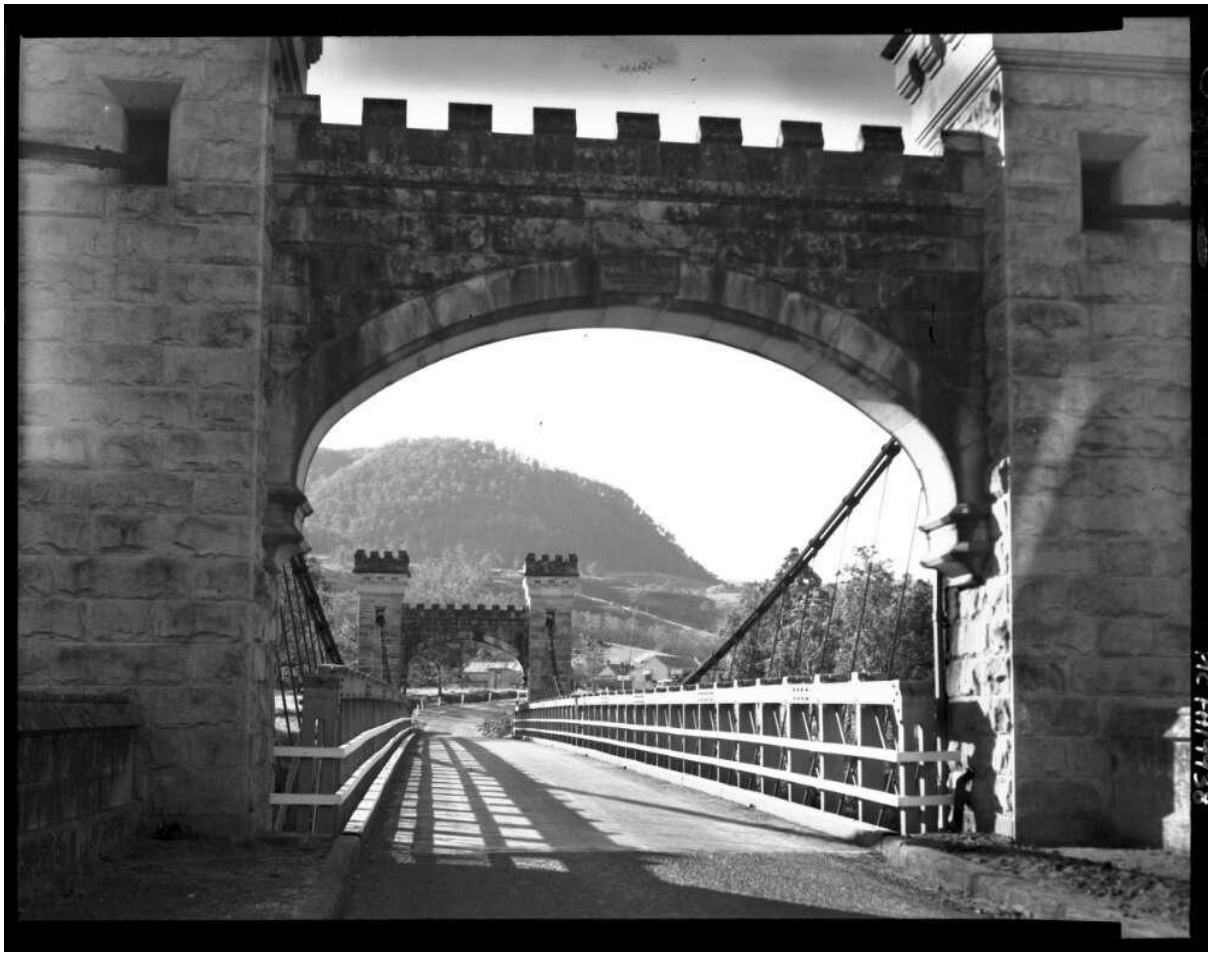

Image 6 One of the finest historical photographs of Hampden Bridge (as a double lane, unrestricted through way with no weight limits), Frank Hurley, unknown date/circa 1910?, (NLA, PIC FH/9938 LOC Cold store PIC HURL 358/10) Many older Kangaroo Valley residents recall this as a halycon era that lasted for most of the 20th century. In the 21st century Hampden Bridge has an equally important role to play as an historical icon, engineering masterpiece and visitor attraction.

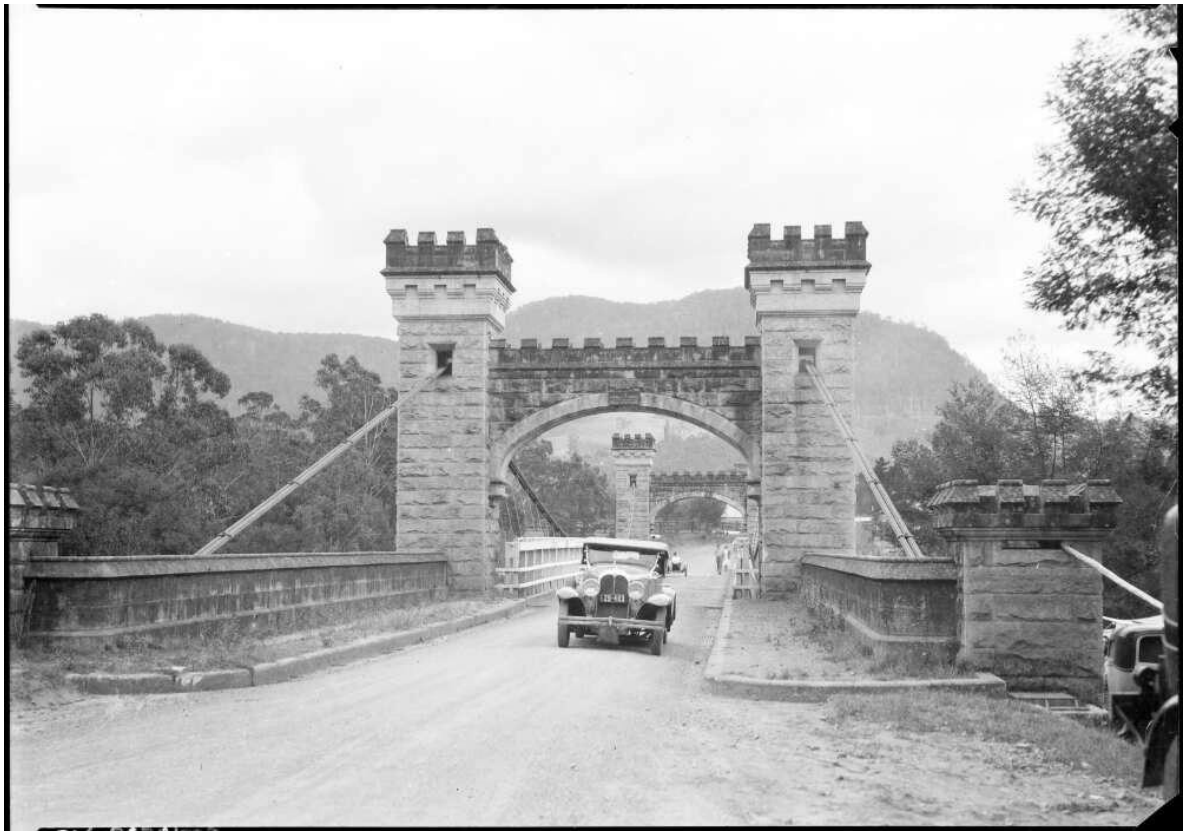

Image 7 E.W. Searle, Car parked on Hampden Bridge, Kangaroo Valley, New South Wales, ca. 1935 NLA PIC P838/723 LOC Nitrate store PIC Box 24, https://nla.gov.au:443/nla.obj-141983762

Image 8 View of Hampden Bridge, Kangaroo Valley with vehicle crossing. Berrima District Historical & Family History Society Inc P153, 6cmx11cm Black & White original

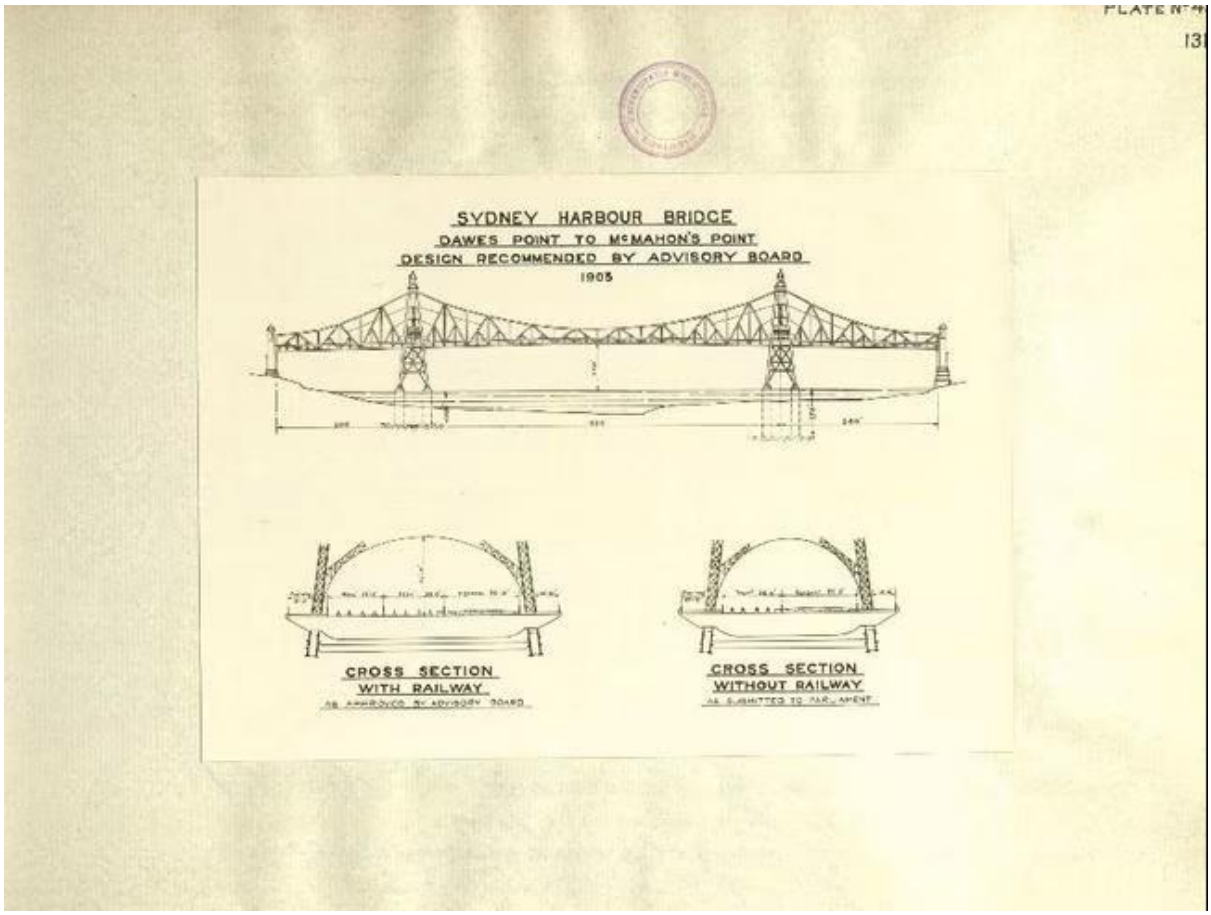

Image 9 Why was Hampden Bridge so revered? For many years after Hampden Bridge was built in 1898, "the suspension principle" was "best practice" and the model for a Sydney Harbour Crossing. The image below, which draws a suspension bridge from "Mc Mahons Point to Dawes Point" is from John Bradfield's office papers that were donated to Sydney University's Fisher Library by his son. John Bradfield began his career under Ernest de Burgh designer of the Hampden Bridge. The era of light weight structural steel meant that the Sydney Harbour Bridge as we know it today was designed by Bradfield as a metal coat hanger rather than a cable bridge. But from Brooklyn to San Francisco to Hampden Bridge Kangaroo Valley the era of high quality steel cables was an important engineering milestone in the evolution of modern bridges and crossings.

VII A Bridge Built for Eternity

Image 10 Hampden Bridge Construction 1897/8

Hampden Bridge: Liberty, Progress and Federation

A bridge across the Kangaroo River was a long-standing need from the mid 18th century, not just for Kangaroo Valley, but for the South Coast . In 1875, following a meeting at the Kangaroo Valley Public School, Valley resident Neil Harper wrote “The residents of Shoalhaven and Ulladulla are as much interested in the erection of the bridge as we are if they expect their mails regular in winter time, and surely it cannot be for the sake of a few hundred pounds that this matter is so long deferred.” ("Kangaroo Valley River Bridge.") ("Kangaroo Valley.") On 14 August 1879 the first wooden bridge was completed[3]. Everyone wanted to celebrate it. ("To the Editor of the Kiama Independent.") It was saved from burning down ("Fire at Kangaroo Valley.") and served the community well until the 1890s but soon its flaws began to be apparent.

In 1895 Ernest de Burgh visited Kangaroo Valley to take levels for a new bridge.(Clark p.6) *The Shoalhaven Telegraph* painted a picture of the new bridge as follows:

> *‘The new bridge is to be constructed on the suspension principle, the spans being supports of ends of cables being about 253ft. To carry the cables there will be erected on each side of the river a pair of towers of sandstone masonry, procured from the immediate vicinity of the bridge. These towers will be about 42ft high built on concrete blocks, resting on the present sandstone formation, the masonry to towers being 8ft square. Each pair of towers will be connected by a wall containing an arched doorway 18ft high and as the top sides of the centre walls and heads of towers will be finished with battlement tops, the whole will present the appearance of a structure similar to the famous “Traitors Gate” of the Tower of London or some other gate in one of the older-time castles’. ("A Magnificent Bridge.")*

The new bridge was officially opened on 19 May 1898, two years before Australian Federation. The NSW Minister for Works, J.H. Young, gave the dedication speech and formally bestowed the name before a crowd of 400. The choice was deliberate and symbolic, reflecting the Valley’s strong pro-Federation sentiment and the era’s celebration of British constitutional heroes , (Kangaroo Valley Times, 24 May 1898), (Kiama Independent, 24 May 1898), (Clark).

The name references Governor Lord Hampden (Henry Robert Brand, 2nd Viscount Hampden, Governor of NSW 1895–1899)[4], proposed by Engineer-in-Chief Robert R. P. Hickson as a courteous tribute to his tenure. Young approved after receiving the Governor’s consent (Sydney Morning Herald, 20 May 20 May 1898).

Young made the meaning explicit three years earlier when he opened Wagga Wagga’s Hampden Bridge (1895): “Mr. Young said the bridge was to be named the Hampden Bridge in honor of their new State Governor, Viscount Hampden; buthe det good and worthy as that gentleman might prove himself to be, he hoped the people of Wagga would never forget to associate the bridge with the illustrious patriot (John Hampden), who had fought for the liberties of Englishmen over 250 years before.” (Daily Advertiser, 10 October 1938).

Local sentiment was even more explicit. A correspondent who signed his letter “Kangaroo Valley” wrote to the *Shoalhaven Telegraph*: “If the bridge had been named the John Hampden I

[3] Opened on14 August 1879 by Thomas Garrett, MP.

[4] “Lord Hampden’s real name was Henry Robert Bland. When made a Lord in 1892 he adopted the title “Hampden” because he was ascended on his mother’s side from the famous John Hampden (1595-1643) the great English parliamentarian, patriot and republican, who was opposed to regal tyranny and was one of the men reponsible for the actions that led to Charles the First losing his head in 1649”. (Griffith and Kangaroo Valley Historical Society (N.S.W.) p.63)

fancy a nicer compliment would be paid to his Excellency… In this age of social, political and religious caterpillars and grasshoppers, it is refreshing to read the history of such men. They never bowed down to or worshipped the Golden Calf; they felt and acted if they were sent into the world to perform duties instead of enjoying privileges." (Shoalhaven Telegraph, 28 May 1898).

Hampden Bridge in Kangaroo Valley thus stands as one of the clearest built expressions of the late-1890s belief that Australia's coming nationhood was the natural continuation of the long struggle for parliamentary liberty that began with John Hampden's refusal to pay an illegal tax in 1637.

Hampden Bridge was not only significant for the time it was built and for the national aspirations it inspired, architecturally it was also significant. A suspension bridge was the prototype for a proposed Sydney Harbour Bridge.(Bradfield) J.J.C. Bradfield, architect and engineer of the famous Sydney Harbour Bridge, begun in 1923, was clearly influenced by many aspects of the Hampden Bridge, including the use of the quarried Mt Gibraltar stone that came down by horse and dray to the Kangaroo River and was sent by rail for many of Sydney's finest buildings.(Irving, Powell and Irving) Bradfield learned from de Burgh and Hickson. Though his signature is not on the original designs of Hampden Bridge, papers donated by Bradfield's son to University of Sydney show that the young Bradfield, who had been made a permanent draftsman in Public Works in 1895, was part of the team to build a 'Bridge over Kangaroo River, road Moss Vale to Nowra'.(Hickson et al.) It may have been his first opportunity to work on official bridge drawings and calculations.

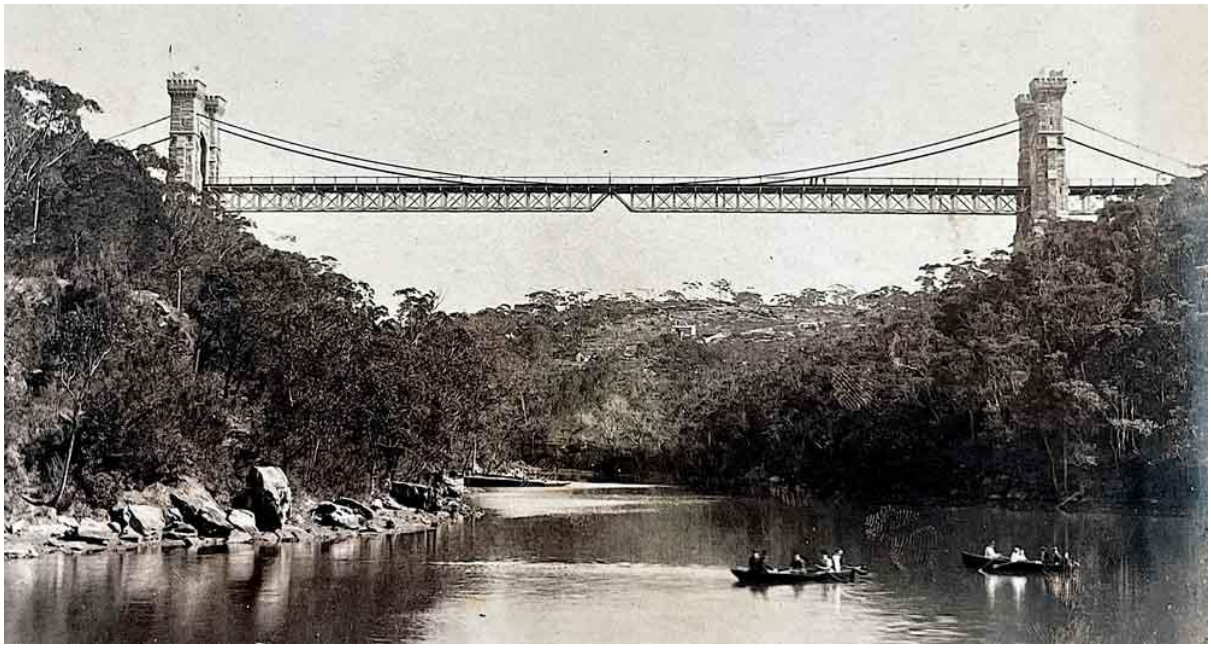

Image 11 The "long gully" bridge at Cammeray designed and built by J E F Coyle with input from Prof W H Warren (Sydney University) (1892) was not as well designed as Ernest de Burgh's bridge over the Kangaroo River. It was replaced by a concrete arch bridge in the 1930s. However the majesty of the suspension bridge was much appreciated and the bridge still remains on the heritage list # 4309506 However Hampden Bridge remains the only operating suspension bridge in Australia.

Building Hampden Bridge (1895–1898)

The bridge over the Kangaroo River would be a composite of the battlements of the Tower of London and the suspension cables of New York's Brooklyn Bridge – a wonder for a bridge in regional NSW. The designer was Ernest de Burgh, Assistant Engineer for Bridges, under the supervision of Chief Engineer for Bridges Robert R. P. Hickson. The deck would sit 60 ft above the river, a total length of 928 ft including approaches. ("A Magnificent Bridge."). The contractors Loveridge and Hudson, constructed some significant Sydney sandstone buildings including Sydney's famous Customs House, the Equitable Life Building on George St. Thomas Loveridge lived in Bowral overseeing the famous *trachyte* quarry at Mt Gibraltar. (Clark p.7) (Estcourt, Lemann and Simons) (Irving, Powell and Irving) (Lemann) James Rorison was the resident engineer.("Kangaroo Valley Bridge.")

The hand drawn bridge tender documents are a wonder to behold.

The reproductions below come from a copy of the tender documents held in the Mitchell Library which were owned by W.S. Scott whose family became intertwined in the Upper River with other pioneering Valley farming families. From this we can discern that many farming families worked on or were contracted for different parts of the production process.(E. M. de Burgh)

We reproduce the five original figures here as a tribute to the early bridge builders of NSW and also a reminder to the 21st century of the care and craftsmanship that went into the construction of a simple bridge across the Kangaroo River in 1898.

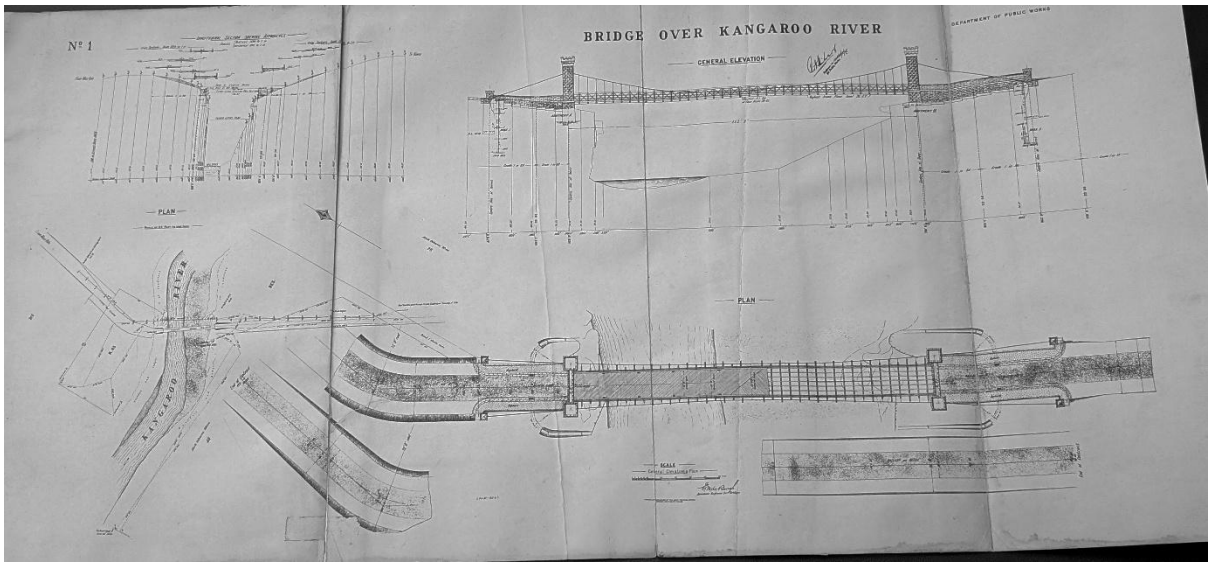

Image 12 ***General Elevation and Plan, 1895*** *(Mitchell Library, Q624.23/1 – Sheet No. 1) Signed by Robert Hickson and E.M. de Burgh – the classic side view that has appeared on countless postcards.*

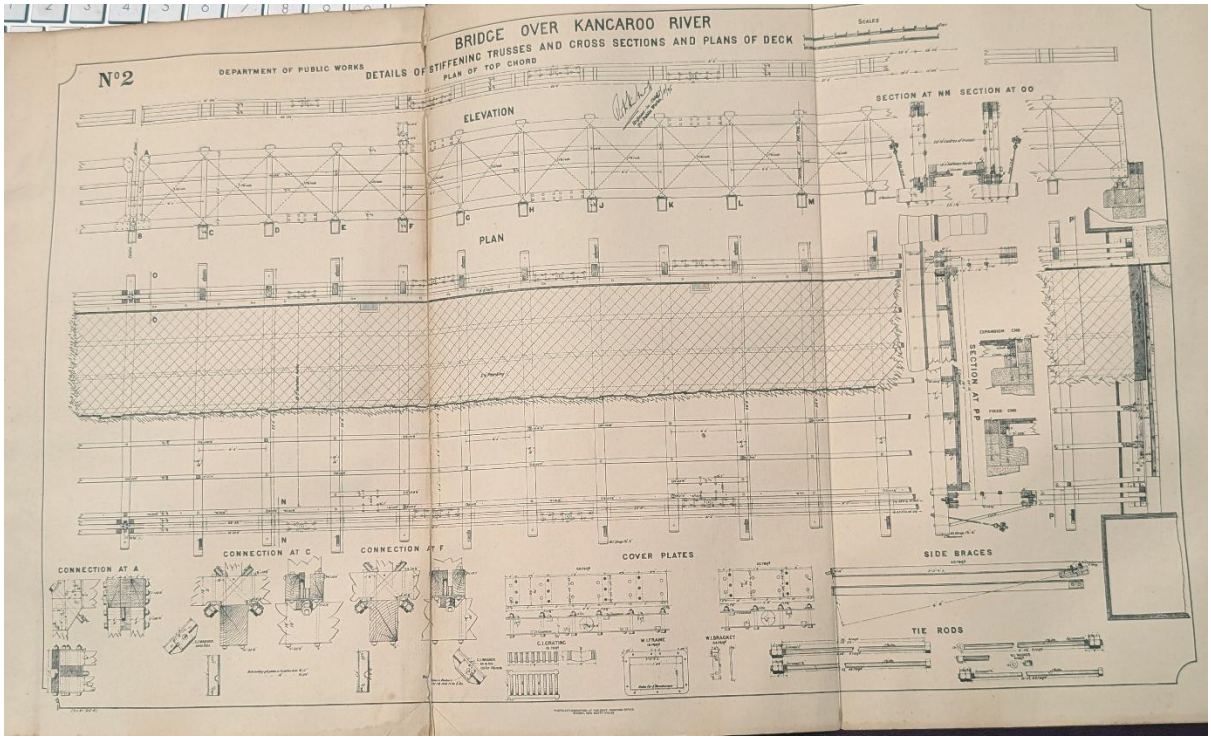

Image 13 ***Details of Stiffening Trusses and Cross Sections and Plans of Deck, 1895*** *(Mitchell Library, Q624.23/1 – Sheet No. 2) Pratt truss 4.27 m deep, Oregon pine chords, steel diagonals, 18 ft roadway + 2 × 1.2 m footways*

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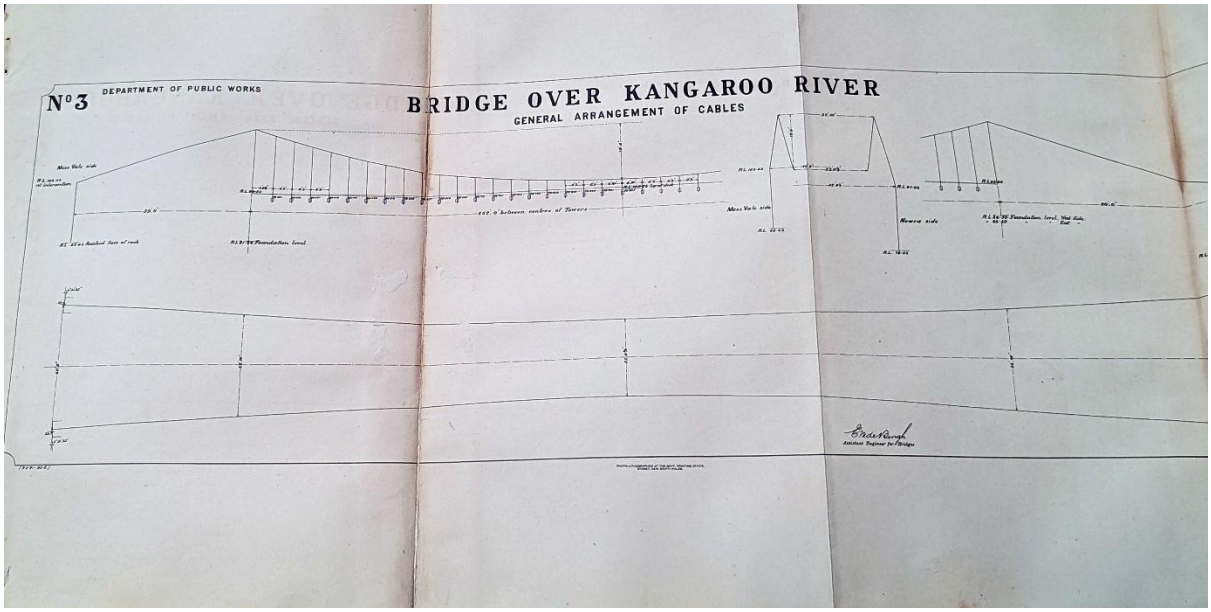


Image 14 ***General Arrangement of Cables, 1895*** *(Mitchell Library, Q624.23/1 – Sheet No. 3) 28 ropes in 4 hexagonal nests of 7, 1½ inch circumference each, 180 ft long, 80–90 tons ultimate strength per rope.*

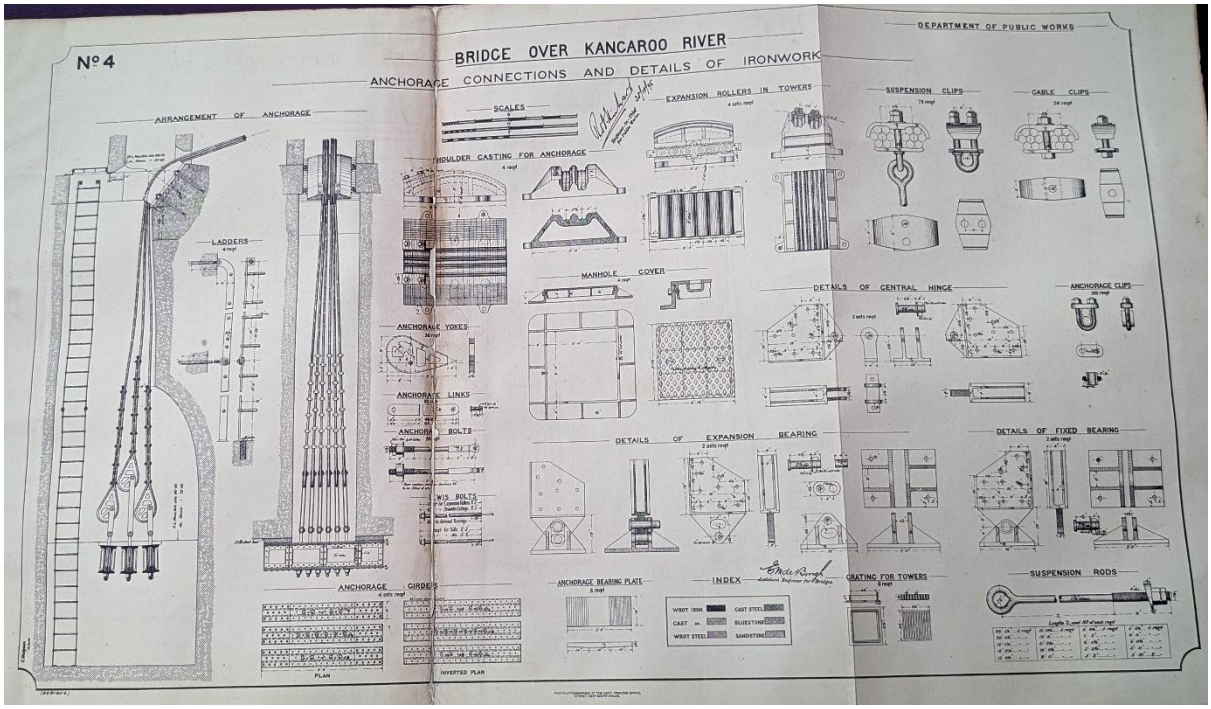


Image 15 ***Anchorage Connections and Details of Ironwork, 1895*** *(Mitchell Library, Q624.23/1 – Sheet No. 4) Dovetailed anchorage girders cut 24 ft into solid rock, expansion rollers in towers, suspension clips – the "umbrella spokes" of 1897*

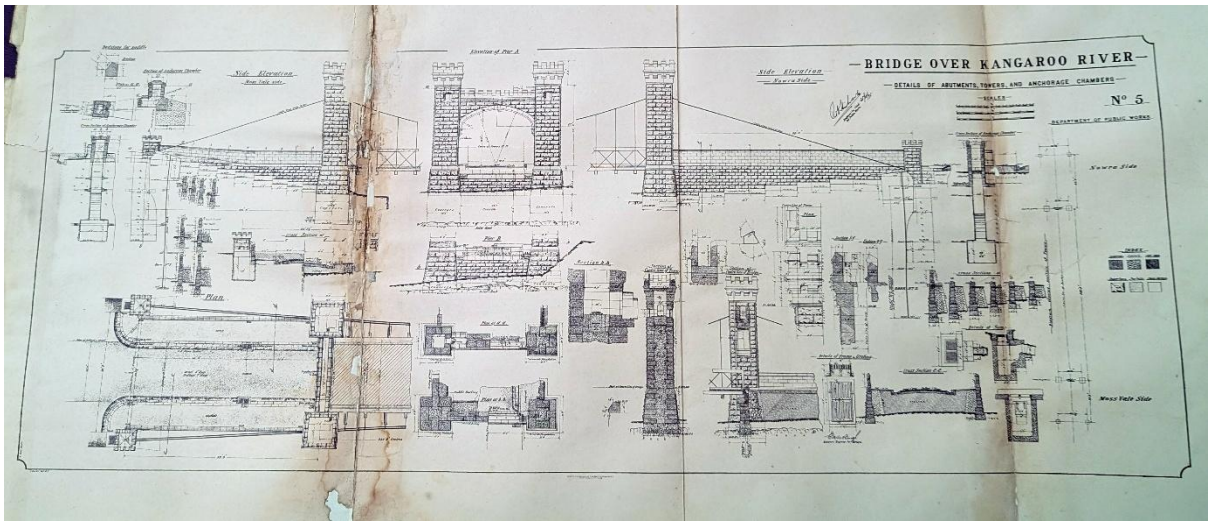


Image 16 ***Details of Abutments, Towers and Anchorage Chambers, 1895*** *(Mitchell Library, Q624.23/1 – Sheet No. 5) Towers 42 ft high, 8 ft square at base, battered 1:20, parabolic relieving arch, drainage tunnels – the arch whose keystone Miss F. Comer laid on 6 June 1896.*

The work of building the bridge began in 1895. On 16 May a Kangaroo Valley correspondent noted: "The work at the new bridge is growing apace, and a fair idea of the immense solidity of the foundations may now be gathered.´("Kangaroo Valley.")

Image 17 A blurry but all important photograph of the original hard wood deck during construction with the original bridge still alongside c1897

30 May 1896 – Laying the Keystone On Saturday 30 May 1896 Miss Florence Comer[5] laid the keystone of the eastern pier's parabolic relieving arch. She climbed the ladder, stood unsupported on the centre of the arch, and trowelled cement for fifteen minutes. The traditional question rang out: "Is the stone well and truly laid?" The cornermen Finley, Kent, Lauder and Rorison (Clark p.8) answered with a resounding "Aye!" In the evening the contractors' men toasted "the fair keystone setter" at the Commercial Hotel until 11 p.m. ("The Kangaroo River Bridge.").

October 1896 – March 1897: Digging into the Gorge The work began on 14 October 1896 with excavation for the western anchorage, seven labourers and two bullock teams struggling in wet ground. By 22 November the contract had been awarded and foundation work on the western tower was under way (Fraser).

November 1896 – Delays Cables arriving from London delayed work on the Bridge until June 1897. John Garbutt (42) was killed by an ironbark log while gathering timber for the bridge on 13 November. He was survived by five daughters and his wife Mary seven months pregnant. His son born two months later was named John in his memory.(Clark p. 16)

April – September 1897: Towers Rising In May it was reported that some of the cables had arrived.("Kangaroo Valley News.") By June 1897 the eastern tower foundations were complete, eight stonemasons laying Gothic courses with two-ton blocks (DJ.). De Burgh visited on 18 June and wrote that the battered bases (1:20) were holding firm (E.M. de Burgh). By September workers were engaged in enlarging holes in girders. ("The Kangaroo Valley Suspension Bridge.")

July–August 1897 – The Cables Go Across On Friday 9 July 1897 the first of the twenty-eight wire-rope cables was drawn across the river and christened with local "Pioneer" brew (Kangaroo Valley Times, 10 July 1897). By 7 August twenty ropes were permanently fixed, their suspension bolts dangling "like a lot of umbrella spokes". Valley residents were glad that the explosions set by miners in the drainage tunnels were now at an end. ("The Kangaroo River Bridge.").

October 1897, The Final Push On the 22 October Oscar Bennett (38) fell 60 feet to his death after losing his footing. Bennet was buried in the Kangaroo Valley cemetery and was survived by a widow and two small children. (Clark p. 18) In another incident the Pratt truss sections were hauled down the escarpment by four bullock teams – one team bolting at a hairpin bend and delaying the convoy for hours (O'Connor, 1985).

The Anchorages – The Secret of Long-Term Stability The cables are secured directly into the gorge's sandstone cliffs via gravity anchorage, relying on the overlying rock mass rather than concrete or pure friction for holding force. Long horizontal tunnels (main drives) were driven into the cliffs, with lengths of nearly 100 ft on the Nowra side and about 66 ft on the Moss Vale side. Crosscuts connected the vertical anchor chamber shafts on each side. The twenty-eight wire-rope cables descend down these vertical anchor chamber shafts to links and bolts securing them to anchorage girders dovetailed into recesses at the shaft bottoms. The tunnels were essential for drainage: after heavy rains, the sealed shafts filled completely with water percolating through rock joints. When miners broke through the final crosscut into a flooded chamber, the trapped water surged out violently—"a sudden appearance of a mill-race running out of the mouth of the tunnel"—amazing passers-by on the old timber bridge nearby

[5] Florence Comer was the sister of Fanny Louisa Diggins (née Comer), licensee (publican) of the Commercial Hotel (now known as The Friendly Inn) in Kangaroo Valley during the period when Hampden Bridge was under construction (1895–1898)

("Kangaroo River Bridge."). This innovative rock-embedded system, with drainage tunnels keeping chambers dry, has contributed to the bridge's durability through floods for over 127 years

February 1898 – Open for Traffic/The First Great Test/Old Bridge Swept Away In early 1898 the hardwood decking was complete and the bridge was ready for traffic (O'Connor). On Wednesday 2 February 1898 John King, J.P. drove a buggy across the Bridge declaring it open to vehicular traffic. King was also the first to traverse the older bridge in 1879.(Clark p. 20) Only a few days after the new bridge was open to traffic, Kangaroo Valley was hit by a storm bringing 20 inches of rain. The river rose 56 ft, coming to within 9 ft of the new deck and turning the valley floor into a 1½-mile-wide lake. The old timber bridge was torn away at dawn. Horses, cattle, and pigs were seen floating past the township. Families fled to higher ground in the night. The National Hall filled with 5 ft of water; the piano floated onto the stage and the Freemasons' regalia was destroyed. No lives were lost, but the flood left the Valley stunned – and grateful that de Burgh's bridge stood untouched ("Sunday's Storm.") The loss of the old bridge which was being dismantled, relieved the need for James Rorison and his team to finish the dangerous task of dismantling it, but debris flowed down the river and even today parts of the ironwork can still be seen along the river banks.("Disastrous Flood in Kangaroo Valley.")

May 1898 – Official Opening On Thursday 19 May, 1891 Hampden Bridge was officially opened and named.. Four hundred locals gathered on the new deck. The bridge was formally opened by Minister J.H. Young, who declared it open for traffic and read a congratulatory letter from Lord Hampden. The name "Hampden" was unveiled, the crowd cheered, and a banquet for 100 guests followed at the Commercial Hotel. The health of the Minister, Engineer-in-Chief Hickson, designer de Burgh, and the contractors were toasted with musical honours ("The Hampden Suspension Bridge"); ("Kangaroo Valley Suspension Bridge.") ("The Minister for Works at Kangaroo Valley.").

The Team

- Designer: Ernest Macartney de Burgh CMG – Assistant Engineer for Bridges (reporting to Chief Engineer Robert R. P. Hickson) Apprentice Engineer and draftsman J.J.C. Bradfield.
- Resident Engineer James Rorison
- Contractor: Loveridge and Hudson, Sydney (Hoskins)
- Labour: Stonemasons, labourers, and bullock drivers from Sydney and the Valley
- Peak workforce: ~50 men

Time: 28 months. **Cost**: £11,873. **Labour:** 50 men at peak. Two lives lost.

The Kangaroo Valley and South Coast community fought for decades to get it. They built it to last forever. 128 years later, it still stands. Let it be the centre of our community and road system for another 128 years.

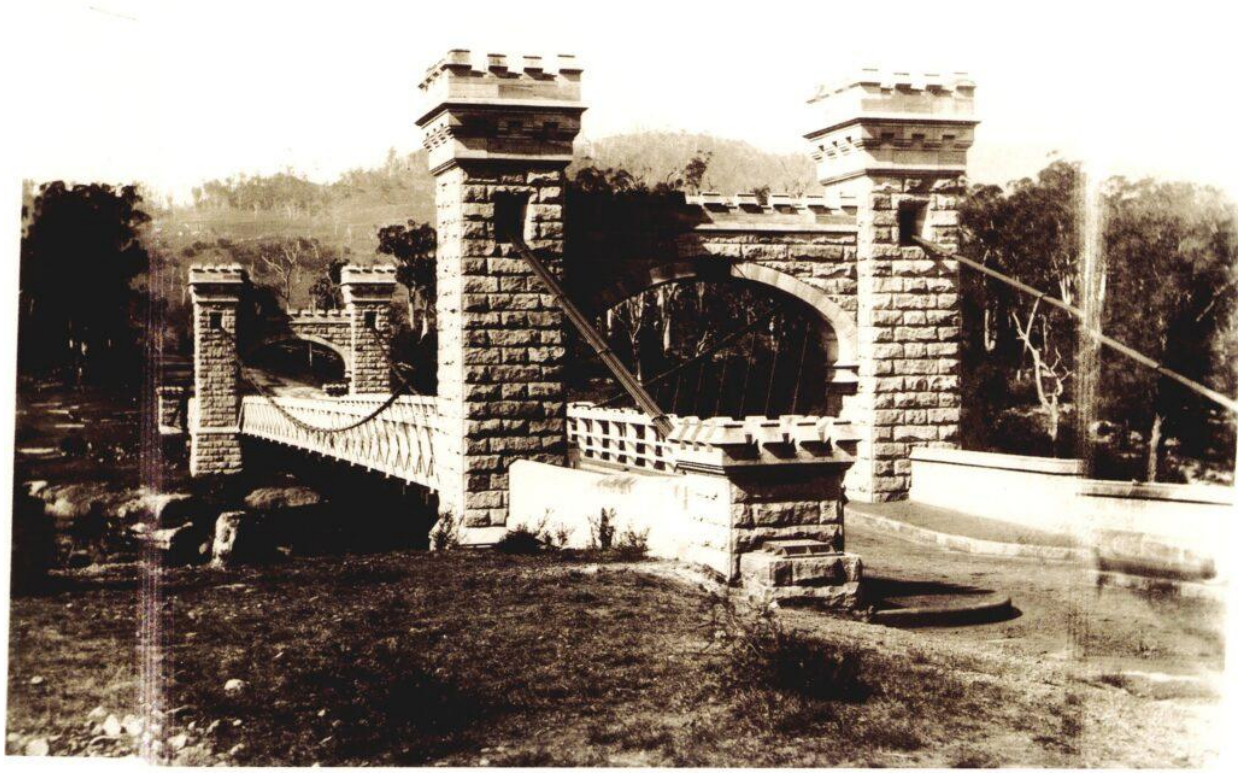


Image 18: The Completed Hampden Bridge 1899 from Sally Latham, "Historical Snippets", Kangaroo Valley Voice, Sept 28, 2022

VIII A Formidable Community: *Kangaroo Valley's Hampden Bridge and Road Wars of the 2010s*

Kangaroo Valley community bands together when it faces a crisis. (See A Series of Unfortunate Events, pp. 68-70) This report, building on the constructive actions of the past, is not about just *filling today's pot holes* it is about ensuring such problems do not occur in the future, and that **the community** is firmly in control of its destiny - not bureaucracy or Federal, State or local government.

It is a case of united we stand, divided we fall.. particularly on the number one perennial issue for the Kangaroo Valley community: *the state of the roads*. To live in the remarkable Kangaroo Valley has one inevitable drawback, a daily or weekly return trip of many kilometres[6] to shopping centres, work, hospitals etc over windy roads which can often be dangerous and sometimes impassable.

Kangaroo Valley is a formidable community. In 2010, when the rumour went around that the Roads and Traffic Authority (RTA) wanted to close Hampden Bridge for six months, few people in the Valley were unaffected. Those who might have dissed each other moments before, came together as long lost friends. The best customers of Nowra Chemicals and the bitter opponents of chemicals on farms and glyphosates embraced each other with open arms. It was an urgent alliance bound together by self interest.

Every Kangaroo Valley resident opposed the RTA.

The *Kangaroo Valley Voice* aired the legitimate outrage in the community that came from several years of very poor communications between the Iemma, Rees and Keneally State Labor governments', the roads department and the community. (2010, May) Kangaroo Valley Voice Editor Carl Leddy raged against the RTA: cutting down the mature trees that had "graced Moss Vale Road." 100 crosses ringed the *Kangaroo Valley Voice* frontpage. 23 July 2007 was "the day democracy died", when 'Kangaroo Valley versed the RTA Gorillas in the mist' (Leddy) And all this came on top of the tragic deaths of Moss Vale teenagers on Moss Vale Road in 2002. ("Moss Vale Grieves Loss of Teenage Friends Killed in Car Crash") In these years the member for Gilmore Joanna Gash had a strong majority and she was seen to be an effective advocate against the seemingly uncaring State and Federal governments. It may come as a surprise to some that Gash was not afraid to stand up, even against the leader of her own party to represent her consituency. She earned respect, even from opponents, standing with Greens candidate Lee Rhiannon against the cutting down of over one hundred trees along Moss Vale Rd in 2007. ("Disdain: Disregard: Deception: Dishonesty: Distortion: Resulting in Deliberate Destruction, Despicable Desolation" p5) Notably, Gash built a consensus that arguably, enabled Gareth Ward, just a few months after "the Valley road and bridge wars", with a nineteen per cent swing, to win the state electorate of Kiama against the sitting Labor member and former Minister Matt Brown. (Green)

[6] The return journey from Kangaroo Valley is to Nowra 46km, Bowral 80km, Mittagong 88km, Moss Vale 68 kms

The level of concern and confrontation in the community was reflected in a series of front pages of the *Kangaroo Valley Voic*e at the time: “What is particularly frustrating is to note that for years the parents of the public school have asked politely for a school crossing, that the community has asked for safer speeds.. This community has pointed out the dangers of hair pin bends, the lack of road markings, the poor road drainabe and the insufficent warnings prior to crossing Hampden Bridge... They even turn a blind eye to the daily illegal actions of truck drivers as they try to navigate the mountain passes..” ("Rta Has It All Wrong")

Kangaroo Valley Voice

Volume 13 Issue 1 ISSN 1833-8402 Circulation 800 July 2007 $2

RTA has it all wrong

“After meetings, consultations, more meetings and plenty of letters the RTA is not listening to our needs” is the claim *of the members of RAG.*

“This is arrogant, professionally negligent and their plans would therefore be an inappropriate use of public funds.

The Moss Vale Road Action Group (RAG) represents many of the local associations and together we seek to protect all those who use the road and protect our heritage.

We simply believe that the two RTA proposals presented as the No.1 safety issues for Moss Vale Road are not the priorities for our community and our tourist industry.

As they currently stand the RTA’s proposals will cause irreparable damage to our National Trust listed landscape.

And importantly we believe that these ad hoc ideas do not form a sound strategic plan for the future.

What is particularly frustrating is to note that for years the parents of the public school have asked politely for a school crossing, that the community for years has asked for safer speeds and that residents have called for wildlife and livestock warnings.

Little if any thing has been done.

This community has pointed out the dangers of the hairpin bends, the lack of road markings, the poor road drainage and the insufficient warnings prior to crossing Hampden Bridge.

Despite this the RTA has continued to permit traffic to cross Hampden Bridge at 60 kph while pedestrians sway to and fro.

Permit cyclists to drop off the side of the road when heavy traffic passes.

They even turn a blind eye to the daily illegal actions of truck drivers as they try to navigate the mountain passes (something they often have to do due to the road design).

And astoundingly the RTA ignores the dangers to our children as the school zone signs lay camouflaged.

What is so shocking is that after we have all complained, lobbied and protested about the real issues the RTA now want to spend the best part of half a million dollars.

On two actions none of us have asked for.

Yet the democratically requested pathways that would cost a similar amount are not built due to insufficient funding.

At the RTA organized public meeting in early June many photographs highlighting the serious Moss Vale Road were presented.

Is this community being taken for a ride?

One horror spot: the junction of Tourist Road and Moss Valle Road where trucks cross the double lines and threaten motorist’s safety.

Proof that trucks cross double white unbroken lines.
Proof of poor and dangerous signage.
Proof of dangerous road shoulders.
Proof of road kill.

Using the RTA’s own figures we were able to prove that most accidents occur on corners and non junctions – locations where they have not attributed any funds.

It was even possible to quote the RTA team, who look after the bridge, and confirm that their sensors have noted many vehicles crossing with The RTA’s own report – EIS 2002 - states that the road is unsuitable for trucks and B Doubles. Their reports clearly state that Kangaroo Valley is “an area of high conservation value”.

(Continued on page 5)

Winter Dance Wonderland (see more page 10)

Club closes!
See story page 28

Image 19 Kangaroo Valley Voice 2007 “RTA has it all wrong”

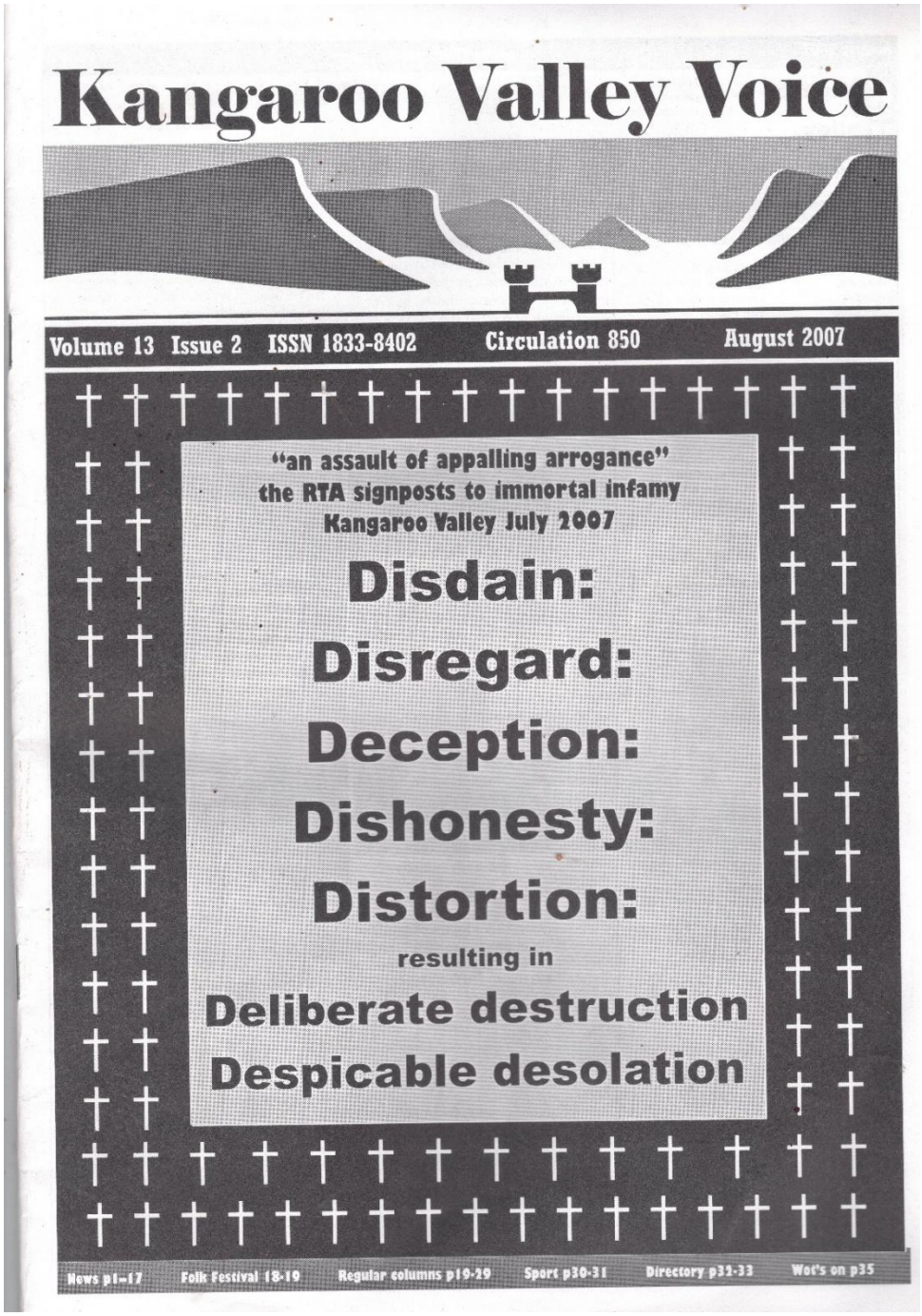
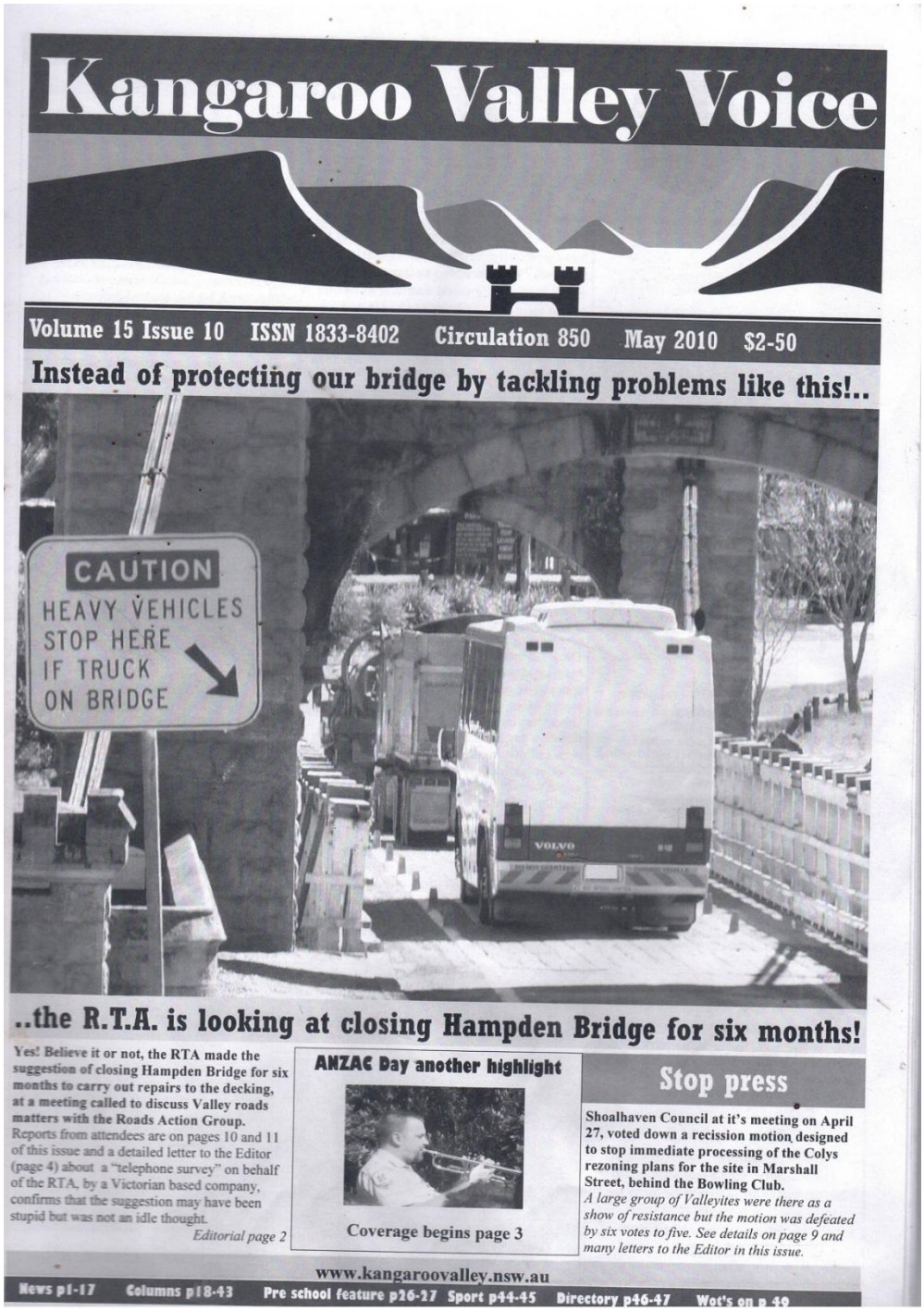


Image 20 Kangaroo Valley Voice August 2007 "Disdain: Disregard: Deception: Dishonesty: Distortion resulting in Deliberate Destruction Despicable Desolation"

The confrontation with the RTA in 2010 did not come from no-where. It followed years of bad relations between Valley locals and the RTA over issues such as truck safety on the mountain and the poor relations peaked with the cutting down of 100 trees in 2007 ("Disdain: Disregard: Deception: Dishonesty: Distortion: Resulting in Deliberate Destruction, Despicable Desolation").

There was also periodic discontent from the less vocal and public Valley farmers to anyone that would listen: Hampden Bridge had a *"used by date"* that had passed, and a new bridge was needed. The fact that this position was directly contradicted by the analysis of well respected bridge engineer Bruce Ramsay and others at the time, did not matter because no-one, whatever their position, was agreeable to a six month closure of the bridge.

Arguably the day was saved by the Moss Vale Road Action Group (RAG), chaired by Wendy Caird, who built a formidable community base of support (Caird p. 3) and were able to suggest the idea of night closures. Also Bruce Ramsay's expert remarks on the remarkable qualities of Hampden Bridge could not be ignored. It was just nonsense in his view, to blame Hampden



Kangaroo Valley Voice

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Instead of protecting our bridge by tackling problems like this!..

CAUTION
HEAVY VEHICLES
STOP HERE
IF TRUCK
ON BRIDGE

..the R.T.A. is looking at closing Hampden Bridge for six months!

Yes! Believe it or not, the RTA made the suggestion of closing Hampden Bridge for six months to carry out repairs to the decking, at a meeting called to discuss Valley roads matters with the Roads Action Group. Reports from attendees are on pages 10 and 11 of this issue and a detailed letter to the Editor (page 4) about a "telephone survey" on behalf of the RTA, by a Victorian based company, confirms that the suggestion may have been stupid but was not an idle thought.
Editorial page 2

ANZAC Day another highlight

Coverage begins page 3

Stop press

Shoalhaven Council at it's meeting on April 27, voted down a recission motion designed to stop immediate processing of the Colys rezoning plans for the site in Marshall Street, behind the Bowling Club.
A large group of Valleyites were there as a show of resistance but the motion was defeated by six votes to five. See details on page 9 and many letters to the Editor in this issue.

www.kangaroovalley.nsw.au

News p1-17 Columns p18-43 Pre school feature p26-27 Sport p44-45 Directory p46-47 Wot's on p 49

Image 21 Kangaroo Valley Voice, May 2010 Instead of Protecting our Bridge by tackling problems like this! .. the RTA is looking at closing Hampden Bridge for six months!

Bridge for the bad traffic managment of the RTA, and this remains the view of the majority of Valley residents today. It was absurd to suggest Hampden Bridge needed replacement. Ramsay wrote: Hampden Bridge "..is an iconic, historic structure well worthy of full heritage listing, on the national register and must be fully preserved in its original state as a working structure., both now and for future generations". (Ramsay p. 3)

All this was occurring at a time when Ron Bower and community members such as Dave Selby worked voluntarily to create the community pathways that now run from

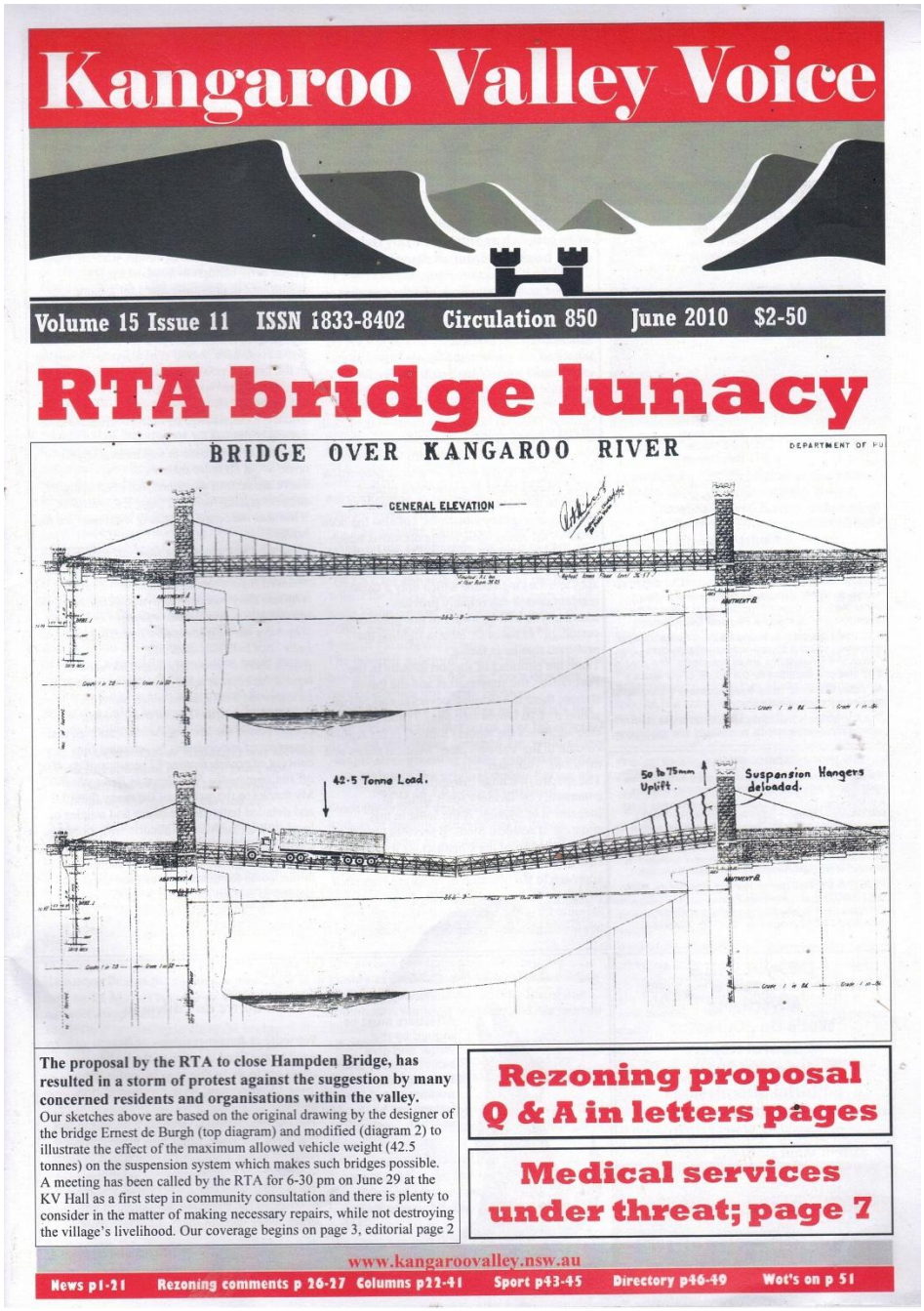


Image 22 Kangaroo Valley Voice June 2010 RTA Bridge Lunacy

Jarrets Lane to Barrengarry Store and have created a new atmosphere of safety for pedestrians and cyclists along Moss Vale Road and over Hampden Bridge. (Bower p. 5)

At this time tension reigned within the community. Everyone was united in ensuring that the bridge was not closed.

The front page heading of the Kangaroo Valley Voice in June 2010 was headed in red: "RTA Bridge Lunacy" ("Rta Bridge Lunacy") Hampden bridge's state of dis-repair became something associated with government arrogance and bureacratic disdain. The Valley Voice referred to Bruce Ramsay, who had for years alerted the RTA to "excessive wear in the control pins and centre span pin joint", changes to the original planking for the bridge deck, rotten planks on the underside planking layer. He contended there was "a lack of care and extreme negligence of those reponsible for the safe operation of the bridge" . His expert view was that Hampden Bridge's "Factors of Safety" had been significantly reduced from those of the original design.(Ramsay)

Ramsay argued this was not just a tragedy for Kangaroo Valley but for the nation: "The Hampden Bridge, Kangaroo Valley is recognised by the engineering fraternity as the most historically significant bridge in Australia, after the Sydney Harbour Bridge. It is the last remaining example of a major timber suspension bridge still in operation in Australia. It is an

iconic, historic structure well worthy of full heritage listing, on the national register and must be fully preserved in its original state as a working structure, both now and for future generations" (Ramsay)

The July 2010 issue of the Kangaroo Valley Voice reported that KV Hall was packed to the rafters: 'the question of the closure of Hampden Bridge was ventilated at an intense gathering of top managers, engineers and PR people as the RTA fronted an audience that could we be described as passionate, concerned and articulate'("K.V. Hall Packed for Rta Hampden Bridge Meeting")

The Valley Voice held the RTA accountable, and combined with the strength of community resolve, enabled strengthening work to occur at night with no bridge shut down. Ramsay raised several safety concerns including live loading limits, times when Factors of Safety (FOS) were exceeded due to multiple trucks being on the bridge, uneven load distribution on large trucks and trailers even when trucks met the load limits on the bridge. All of these matters were addressed in the structural strengthening of the bridge 2010-12.(Ramsay)

At the end of these trying times the RTA and the community were exhausted and frayed around the edges. After around $3.5 million was spent on bridge repairs it was assumed that the problems had gone away. But for some interest groups the agenda was not to strengthen the bridge but to replace it. Added to this Tranport NSW engineers had raised concerns at problems that occurred as a result of the 2010-12 repairs including the problem of more dead weight being added to the bridge that was potentially unsustainable. (Fok, Nowmani and Parvez)

Thus fourteen years later we find ourselves with another HB crisis and cross roads. The underlying issues also raised in the 2010s, about too many trucks on the mountain and the unsustainable B73 freight route also lingers. These issues again came to the fore in the period from 2019-2022 when fires, floods and covid led to the Valley being cut off . Thankfully relationships with government have greatly improved thanks to the election of two local members Fiona Phillips in Gilmore and most recently Kaitlin Mc Inerney in Gilmore. Unlike in the past there is now a direct and immediate line to Federal and State government Ministers and departmental representatives. This is reflected in the very serious way that the Minister for Regional Roads J. Aitchison has viewed Hampden Bridge and Kangaroo Valley road issues in 2025.

However, it seems obvious that the problems of the 2010s and the 2020s stem from a lack of long term vision and practical plans for Hampden Bridge and B73. The Kangaroo Valley community is coming together to avoid the need for confrontations, fraught debate around several issues:

- Regulate truck movements on B73 around sustainable road limits and acceptable community limits
- Maintain Hampden Bridge as the sole working bridge across the Kangaroo River within the Kangaroo Valley Village precinct
- Strengthen Hampden Bridge to 42.5 tonnes with a priority for transport to local farms, constructions, infrastructure and emergencies
- Create a new focus on Hampden Bridge as an icon of engineering and as a tourist magnet in its own right with its own trust.
- Combine Hampden Bridge's heritage values with the most innovative steel and engineering techniques (in accordance with the principles of the Burra Charter) to

ensure Hampden Bridge will be standing strong and serving the community for another 150 years.

Hampden Bridge, named after John Hampden, the man who defied the unjust taxes of King Charles I, itself embodies new values: unity through Federation and community democracy not rule by lords or kings or large land owners or bureaucrats of politicians for that matter.

IX Seasons of Neglect

Hampden Bridge, reliable, brilliantly designed, iconic and resilient against any flood has become a focal point for Kangaroo Valley. Locals see it as a 'bridge for eternity' but nothing can be eternal without maintenance and care.

There have been times where the love Kangaroo Valley community has for the bridge resulted in innovations and support.

In 1957 the south-east side of the bridge came under the control of the Shoalhaven Council for development as a tourist site. (Clark) Now part of the Holiday Haven tourist park group, the area comprises 21 cabins, 8 powered camping sites and 13 unpowered camping sites. Holiday Haven is well integrated into the greater Shoalhaven Tourist strategy and is an affordable and popular destination. Along with Glen Mack caravan park, Holiday Haven has an important function within the community. However, there is almost certainly a need for Holiday Haven to be even more integrated into the local multi-million dollar walking, kayaking and environmental businesses which are now the dominant industries for the Kangaroo Valley village and the region.

In 1966 the Kangaroo Valley Progress, Tourist and Ratepayers Association asked the Department of Main Roads to paint the bridge in its original colours of white woodwork and black ironwork. (Clark)

In 1968 worried about the bridge's capacity to take heavy loads, DMR imposed a 20 ton weight limit but this was not able to be enforced consistently because the nearest weighbridge was at Nowra. (Clark p.23) The enforceability and policing of weight limits remains a major concern for locals, fifty eight years later in 2026.

Clark notes that in 1968 "However this limit (20 tons) was generally observed, with timber trucks using a nearby ford". (Clark) He makes no mention of the ford in question but it was most likely the ford from Upper River Road to Glen Murray Road which involved a further shallow water crossing on Glen Murray Road near the intersection between Glen Murray Road and Berry Mountain Road. Both these fords were passable when river levels were low which meant heavy trucks effectively by-passed the town. Another possibility could be shallow crossings near the Bendeela Picnic Area which can, when river levels are low, be used for 4wd crossing. Though the Kangaroo River and its upper ancillaries such as Gerringong Creek have several fords it should be noted that the pristine waters of the Kangaroo River are part of the Sydney Water Catchment and this would almost certainly become an issue if fords were used as a bypass or diversion of traffic away from the main Village thoroughfare. This is almost certainly why Transport NSW rejected these options in its initial 2025 assessment of future options for an B73/MVR371 crossing for Kangaroo Valley. (T. f. NSW "Hampden Bridge Replacement Options Study – Internal Draft")

In 1966 the Minister of Lands gave Kangaroo Valley Historical Society (KVHS) permission to set up an historic park and museum on land at the north-western end of the bridge. It was opened in January 1969 and continues to attract many visitors to stop and also to take one of the many Kangaroo Valley bush walks. Since that time it has been revealed that the Nature Reserve, of which the Pioneer Farm land was once a part, was an Aboriginal reserve, the site for a historic Aboriginal school pioneered by Hugh and Ellen Anderson. (P. C. Botsman) This offers a

wonderful opportunity for greater participation from Valley and Shoalhaven First Nations communities and to add a broader understanding of “pioneer farm”.

In addition in 1966-7 across the road from the Pioneer Museum and Farm the development of Apex Park was the first project of the Kangaroo Valley Apex Club. In 2024 the park has been supplemented by the extremely popular Kangaroo Valley Cycling Pump Track which is managed and maintained by the community in conjunction with Shoalhaven Council.

In 1973 K.R. Condon of Bundanoon Quarries replaced a missing corner stone on the bridge. (Clark)

But the major concern over time has been the damage done by heavy vehicles when they crossed the bridge. In 1973 the secretary of the KVHS noted that when members sat in the Museum Park office they could feel the vibrations of heavy trucks and called for an onsite meeting with DMR engineers. One suggestion then was that a new bridge be built leaving the Hampden Bridge for foot traffic.(Clark p. 24)

In 1982 at a cost of $48,667 the longitudinal deck planks were replaced. And on its 90th anniversary Hampden Bridge was named on a list of NSW’s 50 most historic bridges.

- **1990s onward**: Structural analyses began due to increasing loads. Consultants argued for ongoing repairs.
- **2010**: Major rehabilitation, adding significant dead load (strengthening) but revealing issues with some members.
- **2020**: Night closures for essential maintenance (e.g., geotechnical investigations, cable relocation for repairs).
- **2021**: Significant renovations (~$3 million), including structural upgrades.
- **2025 (May–June)**: Load limit reduced from 42.5 tonnes to 23 tonnes after testing showed strain from heavy vehicles, to reduce maintenance needs and preserve integrity while long-term options are explored.
- **2025 (August)**: Urgent night works replaced 9 damaged upper truss timber beams; further strengthening planned for 2026 (12 lower truss beams).
- **Ongoing**: Regular inspections, hanger replacements, load testing, and surveying. Transport notes "higher than normal" maintenance over the past 30+ years, with investigations for temporary/permanent solutions (e.g., new crossing) to allow heavier loads.(Fok, Nowmani and Parvez)

It is generally agreed that as a historic bridge, Hampden Bridge needs its own independent trust and management committee. One of the recommendations of this report is that to ensure Hampden Bridge is never again allowed to deteriorate to the point of crisis, there must be a fully funded, legislated 50-year Heritage Asset Management Plan and Maintenance Endowment (estimated $18 million, invested at 5 % real return to generate ~$900 k per annum in perpetuity) (Heritage NSW, 2024). This endowment, modelled on the highly successful Sydney Harbour Bridge and Hawkesbury River rail bridge trusts, should be established under the NSW Heritage Act with joint TfNSW/Heritage NSW/Environment and local community and First Nations oversight and annual public reporting. This trust might also include the management of the Hampden Bridge precinct including the Holiday Haven camping area and the Pioneer Museum and Farm and the adjoining Nature Reserve.

X Heritage: How is the Heritage of Hampden Bridge legally protected?

The Kangaroo Valley community has a historical role in *looking out* for Hampden Bridge. Thankfully since 2019 Hampden Bridge has been listed on the *state heritage register* which provides for several powerful legislative protections. This listing under the *Heritage Act 1977* ensures that the bridge's cultural, historical, technical, and aesthetic significance is safeguarded, requiring careful management of any works to preserve its heritage values while allowing for essential maintenance.

In a nutshell, “state heritage” listing gives the community the opportunity to ensure that unfortunate neglect that has happened to many other heritage bridges and built structures in other towns such as Windsor, Bourke and Wagga Wagga, and even Nowra, should not happen to Hampden Bridge, Kangaroo Valley. However, even with the strongest heritage protections if there is not community awareness and understanding, then narrow ideas of progress can overtake elegant structures such as Hampden Bridge. “Creative destruction”, one of the driving forces of modern industry and sometimes government agencies, is not always a good thing and needs to be constantly checked.. So it is up to the community and individual citizens to understand heritage law and where necessary to use it for the benefit of future generations as well as honouring and protecting the great gifts that past generations have made to us in the present. In this way heritage structures like Hampden Bridge have rights, obligations and ongoing life and vitality.

Table 1 Hampden Bridge (Kangaroo Valley) Heritage Listings and Protections

Heritage Listing	Listing Title	Listing Number	Gazette Date	Gazette Number	Gazette Page
Heritage Act - State Heritage Register	Hampden Bridge	02024	02 Aug 19	85	3040
Heritage Act - Icons Project Nomination for SHR listing			03 Sep 04		
Heritage Act - s.170 NSW State agency heritage register					
State Environmental Planning Policy	Illawarra REP No.1		11 Apr 86		
Local Environmental Plan	Shoalhaven Local Environmental Plan 2014	241			
National Trust of Australia register	Hampden Bridge	5851	30 Jul 02		
Institution of Engineers (NSW) Historic Engineering Marker			01 Oct 99		
Register of the National Estate	Nom.09/07/1981	001621	18 Apr 89	AHC	

Hampden Bridge was added to the New South Wales State Heritage Register (SHR) on 2 August 2019, SHR No. 02024. The listing followed a decision by the Special Minister of State on 25 July 2019, and it applies to the bridge structure, its curtilage (including the road reserve and part of Lot 7 DP 581233 in the Parish of Cambewarra, County of Camden, as shown on Heritage Council plan HC 3218). This places it among NSW's most protected heritage items. The official listing notice was published in the NSW Government Gazette No. 85 on 2 August 2019.

In addition, as can be seen in the table above, Hampden Brige is listed on the National Trust Heritage Register, Engineers Australia's Historic Engineering Marker program, Transport for NSW's Section 170 Heritage and Conservation Register, and the Shoalhaven Local Environmental Plan 2014 (Item 241).

The bridge's ***Statement of Significance*** highlights its statewide importance as Australia's only surviving colonial-era timber-decked vehicular suspension bridge (completed 1898), designed by engineer Ernest Macartney de Burgh. It is the second major suspension bridge in NSW (following the Long Gully Bridge at Northbridge, completed in 1892, which was later replaced) and exemplifies late-19th-century engineering ingenuity. The bridge has been in service for over 128 years. The form of the bridge, its relatively sophisticated structural design and elaborate tower castellations, reflects the cultural importance of this crossing at its time of construction,

on what was then both a major route to the south of the state, and an area of emerging prosperity. The bridge now facilitates the growing importance of the area as a tourist destination. It is readily viewed and interpreted from the surrounding recreational areas and is held in high esteem by the local and wider community for its historic, aesthetic, and technical qualities. The site also holds Indigenous heritage associations, as a meeting and gathering place for the Wodi Wodi community of the Dharawal nation, with nearby rock art and camping sites evidencing Aboriginal occupation for millenia. For the full statement and details, see the official Heritage NSW database entry Hampden Bridge SHR Listing and Appendix 20

The bridge meets multiple State Heritage Register (SHR) Criteria under the NSW Heritage Council's guidelines:

Criterion A (Historical Significance): In service for over 128 years, it supported the dairy industry's prominence in Kangaroo Valley and communication between Sydney, inland centers, and the south coast. Its sophisticated design and embellishments underscore the route's importance during a period of regional prosperity. As a meeting place for Aboriginal people, the land adds further historic layers.

Criterion B (Associative Significance): Strongly linked to eminent engineer E.M. de Burgh (who designed it and later major dams like Cordeaux, Avon, and Nepean) and builders Loveridge and Hudson, known for quarrying Bowral trachyte used in the towers and other historic structures.

Criterion C (Aesthetic/Technical Significance): A landmark with outstanding visual impact, featuring Victorian Gothic sandstone towers (16.8m high with crenellated turrets and elliptical arches), steel cables (14 per side, 36mm diameter), and a 77m single span suited to the flood-prone ravine. It demonstrates innovative technology for challenging terrain, with experiential qualities like deck movement under load. The structure ranks alongside engineering feats like the Zig Zag Railway.\

Criterion D (Social Significance): In service since 1898 on a major road, this bridge has become well known to the public of Kangaroo Valley, the wider Sydney and South Coast Regions for its rarity value and historic and aesthetic qualities. The bridge is connected with a sense of place both for those who live at Kangaroo Valley and those who visit.

Criterion F (Rarity): As NSW's sole surviving 19th-century timber-decked vehicular suspension bridge, it provides rare evidence of this type, with uncommon anchor structures emphasizing aesthetic detail.

Criterion G (Representativeness): The Hampden Bridge has the capacity to represent some of the key characteristics of a small class of Australian suspension bridges, both vehicular and footbridges, many of which do not survive, or do not survive in their original form.

The bridge retains ***high integrity and intactness***, with core elements (towers, cables, suspension system) largely original despite maintenance. ***Historical context*** traces European settlement in Kangaroo Valley from the late 1810s with cedar-getting and cattle grazing, formalized by surveys in 1831. Dairy farming boomed from the 1840s, with butter production peaking in the late 19th century. The original timber truss bridge (1879) was inadequate for floods and growing traffic, leading to its replacement. De Burgh surveyed the site in 1895, with construction tenders awarded to Loveridge and Hudson for £8,382. Key milestones included tower keystones laid in 1896 and cables sourced from London in 1897. Despite a major flood in February 1898, the bridge opened to traffic on 2 February 1898 and officially on 19 May 1898 by

Minister James Henry Young, named after Governor Lord Hampden. It has undergone regular maintenance and modifications, including:

alterations to the expansion joint on the bridge's deck (1935);

major redecking works (1938–1942)

with the top layer of decking replaced with tallow wood or ironbark, and timber stringers added; longitudinal sheeting added to the deck (1960/61);

some chords replaced and steel sway bracing installed (1967),

noting some timber cross girders had been previously replaced with reinforced concrete; a major rehabilitation (1986)

where cables and hangers were repainted and diagonal bolts/anchor plates changed; and cross girders changed to steel (1991)

following assessments, with lateral bracing installed and stringers increased. Load limits evolved from 14.5 tonnes (original) to 20 tonnes (1968), 42.5 tonnes (2003), and the current 23 tonnes (2025) to preserve structure. (Also see pages of this report),

Physical Description details include: a single 77m clear span with 15m cable sag; 16.8m deck height above water; 3.5m single-lane carriageway with pedestrian walkways; sandstone towers on mass concrete foundations with trachyte bedstones; vertical anchorages in excavated pits with steel beams and thrust blocks; suspension hangers at 6-foot centers supporting galvanized steel cross girders; timber deck with Pratt truss sides (timber chords, steel diagonals); and modern additions like utility pipes, lighting, drainage tunnels, maintenance gantry, and a steel undertruss for stiffness. The main cables consist on each side of fourteen 36mm diameter wire ropes, each with a specified tensile strength of 79.6 tonnes, anchored vertically with length adjustment facilities. The suspension rods hang in an inclined plane to support the deck, terminating through crossbeams (now galvanized steel). The deck is of longitudinal timber stringers supporting transverse and longitudinal timber sheeting, stabilized by vertical side trusses with upper and lower longitudinal chords and verticals in timber, with steel rod cross diagonals. Each side has two such trusses meeting at the center at a hinge connecting the lower chords only, allowing articulation. Lateral bracing is provided by steel angles bolted diagonally to the bottom of the crossbeams. Some 50m upstream there is a modest weir, and the waters below sustain a canoe hire operation. *Condition is good to fair, with ongoing maintenance ensuring structural safety; the continual heavy traffic causes the deck and trusses to undergo reversed flexure, requiring moderately high maintenance levels, though the steelwork, cables, and sandstone elements remain in good condition*.

Under Section 57(1) of the *Heritage Act 1977*, any works that could affect a State Heritage Register item's significance require approval from the Heritage Council of NSW. This includes alterations, excavations, or developments that might impact the bridge's fabric, setting, or views. Heritage impact assessments (HIAs) are mandatory for proposals that could adversely affect significance, ensuring compatibility with heritage values.

The curtilage boundaries protect the immediate surrounds, including landscape features contributing to the bridge's landmark qualities and visual prominence as a gateway. On the map that accompanies the Heritage Listing of Hampden Bridge there appears to be a ridiculously small curtilage boundary of less than 10 metres. However, developments, such as the erection

of a military-style temporary bridge or a permanent new bridge within 50 metres, would likely contravene the broader heritage protections by impacting the aesthetic significance, historical setting, and integrity of the site. Such actions could alter views, introduce incompatible structures, or cause physical vibrations/strain, triggering requirements for Section 60 approvals.

Any attempt to create a structure for any length of time alongside the bridge could lead to legal challenges under the Heritage Act, including enforcement orders, fines, or injunctions from Heritage NSW or courts.

Additionally, given the community's strong attachment and history of advocacy (e.g., through groups like the Kangaroo Valley Community Consultative Body), any such proposals would come under intense scrutiny and would almost certainly face significant community protests, petitions, and public opposition, as seen in recent discussions around load limits and repair works.

Legal Actions

Beyond community protest, a citizen (or any person) could potentially take legal action if a temporary bridge was erected in a way that totally disrupted the Hampden Bridge precinct and breached heritage protections. The Heritage Act 1977 provides mechanisms for enforcement, though avenues for third-party (citizen) action are more limited compared to planning laws like the Environmental Planning and Assessment Act 1979.

Key options include:

Judicial review in the Land and Environment Court (LEC)

Under Section 153 of the *Heritage Act*, any person can bring proceedings in the LEC's Class 4 jurisdiction to challenge the validity of a heritage decision (e.g., a Section 57/60 approval for the temporary bridge) if it involved jurisdictional error, procedural unfairness, failure to consider mandatory factors (like heritage impact on the SHR item's setting), or illegality. Standing is generally broad for judicial review under common law principles or as specified in the Act—often requiring a "special interest" (e.g., as a local resident, community member with historical involvement, or someone affected by the precinct's disruption), but NSW heritage law has allowed "any person" challenges in cases of process flaws (similar to interim heritage order invalidity cases). If the approval was granted without proper HIA, ignored curtilage impacts, or exceeded exemptions (e.g., if the temporary structure lasts beyond short-term limits or causes permanent harm), a citizen could seek declarations of invalidity, certiorari to quash the decision, or injunctions to halt works. Precedents in the LEC demonstrate successful judicial review challenges to heritage-related approvals or decisions where mandatory considerations were overlooked or processes flawed, including:

Community Action for Windsor Bridge Inc v NSW Roads and Maritime Services [2015] NSWLEC 167 ([full judgment): Challenged the validity of a development consent for a bridge replacement project impacting a heritage conservation area, examining whether the Minister failed to adequately address cultural heritage impacts or if the consent lacked certainty/finality—illustrating scrutiny of heritage considerations in major infrastructure approvals.

Currey v Hargraves and Others [2007] NSWLEC 471 (full judgment): Involved judicial review of a consent for alterations to a heritage-listed house, focusing on whether impacts (e.g., on neighboring views and setting) were properly weighed and if the delegate had power to grant consent.

Byron Ventilink Pty Ltd v Byron Shire Council [2005] NSWLEC 395 full judgment: Appeal against an interim heritage order over buildings, considering whether the item was likely of local heritage significance and if the order should be revoked—relevant to challenges on interim protections or flawed heritage processes.

Millers Point Community Association Incorporated v Property NSW [2017] NSWLEC 92 full judgment: Successful challenge by a community group to the Minister's decision not to list the Sirius Apartment Building on the SHR, finding procedural flaws in considering heritage significance versus economic factors—demonstrating citizen standing to contest non-listing or inadequate heritage decisions.

Broader LEC heritage jurisprudence (e.g., cases under analogous planning laws) shows the Court invalidating consents for failure to consider heritage impacts or mandatory HIAs, reinforcing that precinct/setting disruptions can ground successful challenges. For more cases, see the LEC's heritage issues page Heritage Cases.

Civil enforcement for breaches

The Act allows the Minister or Heritage Council to issue stop work orders (Section 79C) if harm is occurring or imminent to an SHR item. While primary enforcement rests with authorities, citizens can report breaches (e.g., unapproved harm to setting via vibrations, visual intrusion, or precinct disruption) to Heritage NSW, potentially prompting action. In analogous NSW environmental laws, open standing exists for breaches (e.g., "any person" under certain acts), but the Heritage Act is narrower—focusing on official enforcement, with prosecutions needing Ministerial consent. However, if the erection constitutes an offence (e.g., unauthorized alteration/damage under Section 57), a citizen could seek to compel enforcement via mandamus in judicial review or, in extreme cases, pursue related remedies. Penalties for breaches can reach up to $1.1 million or 6 months imprisonment.

Practical considerations

Success depends on evidence of heritage harm (e.g., via expert reports on aesthetic/setting impacts). Costs, strict time limits (often 3 months for judicial review), and the need for legal advice (potentially via Environmental Defenders Office, as outlined in their NSW Heritage Law factsheet EDO Factsheet) are key hurdles. Community groups have successfully used judicial review in heritage/planning contexts to challenge invalid processes. In Hampden Bridge's case, strong community interest and the bridge's rarity could bolster standing and arguments that a disruptive temporary structure (especially if military-style and proximate stfructures) fundamentally undermines the precinct's protected values.

To enable practical preservation—especially for a functioning transport asset like Hampden Bridge—exemptions exist for minor and routine activities. A ***site-specific exemption*** was granted on 25 July 2019 (gazetted alongside the listing) under Section 57(2), applying to Transport for NSW as the owner. This allows activities such as restoration (removing non-original accretions without introducing new fabric), maintenance and cleaning (using low-impact methods like neutral detergents), repairs (including structural fixes, material replacements matching originals like timber beams or steel elements, and services upgrades), minor works (e.g., temporary structures up to 12 months, signage, lighting), repainting in matching schemes, minor excavation, landscape maintenance, and safety/emergency measures (e.g., temporary fencing or stabilization). ***These exemptions support ongoing upkeep without full approvals, provided they do not alter significant heritage fabric—directly enabling recent and planned repairs, such as the 2025–2026 replacements of***

timber truss beams and steel hanger bars. Note that longer-term or more impactful temporary structures (beyond 12 months or causing precinct disruption) fall outside exemptions and require full approval.

Complementing this are ***standard exemptions*** (updated and republished in the NSW Government Gazette on 7 November 2025), which apply broadly to all SHR items. These cover simple, low-impact activities like general maintenance, installing safety devices (e.g., fire alarms), or temporary works (including structures up to 90 days under certain conditions), provided they comply with Heritage NSW guidelines and cause minimal or no adverse heritage impact. Major interventions—such as structural upgrades to reinstate higher load limits long-term or developments in the vicinity—still require heritage impact assessments, approvals, and community consultation to respect the bridge's values. For the full standard exemptions guidance, see Heritage NSW Guidelines.

Relevant Maps and Visuals

The heritage curtilage is defined in Heritage Council plan HC 3218 (referenced in the SHR listing gazette and SHR database entry). This plan delineates the protected area, including the road reserve and part of Lot 7 DP 581233. The full plan is held by the Heritage Council of NSW and accessible via the State Heritage Inventory spatial viewer on the Heritage NSW website (SHR Spatial Viewer—search for SHR No. 02024 to view the boundary overlay on satellite/aerial imagery showing the bridge, river, approaches, and protected surrounds). For additional context, interactive maps of the bridge location and general area are available on Wikipedia and Engineers Australia heritage pagesEngineers Australia Page but the official curtilage is best viewed through the SHR spatial tools for precise boundaries relevant to any proposed nearby development.

These layered protections—listing combined with targeted exemptions—strike a balance: they prevent neglect or inappropriate changes while empowering TfNSW to conduct necessary repairs amid seasons of strain from overuse. The community's vigilance, alongside these mechanisms, continues to be vital in ensuring Hampden Bridge endures as a protected heritage asset for future generations, warding off threats like incompatible nearby infrastructure that could undermine its significance. (See Appendix 20)

XI Hampden Bridge: The Next 100 Years

It is important to address the current neglect of Hampden Bridge but also to set up a long term plan that benefits the local, regional, state and national community.

The following analysis is informed by:

- months of daily consultations and discussions with Kangaroo Valley community members of all points of view on the future of Hampden Bridge
- over ten drafts of ideas, wording, analysis, tables read by experts and laypeople alike
- close reading of as many articles, especially peer-reviewed analysis, of heritage building and bridge renovations that are relevant to Hampden bridge from across NSW, Australia and the world
- close reading of Transport NSW annual reports, press releases, project descriptions and publicly available budgets as they pertain to Hampden Bridge

The major finding is that Hampden Bridge has been badly neglected. A comparatively small sum of money has been invested in its upkeep over the past decade. Now a fraction of what has been expended on other major regional projects is needed to bring Hampden Bridge back to strength so that it can fulfill the expectations of the community and all local, regional and national stakeholders- the proviso is no more short term fixes - investments must be planned over the short, medium and long term.

Above all there must be an understanding of just how important this heritage bridge is. Hampden Bridge is an economic magnet and small industry in itself. This more than anything else needs to be carefully understood. The majority community view is that a Hampden Bridge trust must be established to fully realise the value of Hampden Bridge and the bridge precinct. If this trust were established with a brief to examine wider issues of bridge heritage, safety, tourism and fostering the local precinct the danger of the bridge ever falling into disrepair again would be much less likely.

Hampden Bridge is an important pillar in a billion dollar regional tourism industry as well as a logistical canary in the regional road ecosystem. When there is something wrong with Hampden Bridge there is almost certainly something wrong with the entire regional road ecosystem. For all these reasons any investment that is made to keep Hampden Bridge alive and well as a working heritage suspension bridge, will be repaid many times over in economic, social, cultural and environmental profits.

The peer-reviewed paper presented by Transport for NSW engineers at the Austroads Bridge Conference 2022 ("Managing the suspension bridge in Kangaroo Valley (Hampden Bridge)" by Fok, Nowmani, and Parvez) clearly documented the bridge's load deficiency, the added dead load from the 2010 rehabilitation, the ongoing failure of critical members, and the urgent need for a sustainable, long-term strategy involving ongoing and regular **structural health monitoring**, **non-destructive testing**, and **cost-effective interventions** to keep the bridge safe for current legal loads. Hear! Hear!

TfNSW's December 2025 community notification confirms a complex 2026 maintenance program starting late January: replacing 12 bottom truss timber beams, 9 top beams (building on August 2025 work), and 11 hanger bars, with phased night closures and daytime stop/slow controls. This aligns closely with our advocated Phase 1 (truss/hanger stabilization) of Hampden Bridge Repairs. TfNSW notes that reassessment post-2026 may allow temporary

reinstatement of higher loads, but long-term 42.5-tonne capacity requires "full repair and upgrade" under heritage approvals. Meanwhile, a temporary modular steel truss bridge downstream has emerged as a medium-term option (detailed design progressing), with $500,000 allocated for planning a permanent new crossing (mid-2026 completion expected).(T. NSW "Hampden Bridge Repair Work in 2026") There has been a long term transport industry lobby for these options. Some older residents will say “there has been a need for a new bridge for decades”. Much of this report is dedicated to changing this perspective and to ensuring that Hampden Bridge as a historic suspension bridge remains the sole major working crossing over the Kangaroo River.

This report advocates against a future of permanent restrictions, temporary bypasses, or replacement, **the evidence points decisively to phased in-situ strengthening as the most rational, economical, and heritage-respecting path forward.** This section sets out a practical, proven programme that delivers full 42.5-tonne capacity by 2027–2028 – at a fraction of the cost of alternatives – while preserving the Valley's irreplaceable engineering and cultural landmark for generations to come. Transport NSW has shown that it can successfully complete Heritage Bridge projects (e.g., Pyrmont Bridge $59.8M renewal 2023–2035, fully open throughout), and it needs to make strengthening Hampden Bridge and preserving its heritage a priority in 2026.

But beyond this immediate set of concerns, we want to ensure that Hampden Bridge is working and healthy for another 100 years. So this requires new and innovative thinking about how the bridge itself speaks and responds to future needs and demands. It is important to note that the problems of Hampden Bridge have occurred because even a 10-year planning cycle is not concordant with the political cycle and the tenure of parliaments. We must do better than this. That is primarily what this report is about: doing better for the long term!!

Strengthening Hampden Bridge

The strengthening programme that is advocated by this report has not been written predominantly by engineers but by a large group of cross disciplinary experts, engineers and community members. We believe this is what makes this report important. The more informed the community is about the strengths and needs of the Hampden Bridge the better. A community priority is to ensure that all repairs are phased so that every stage is carried out at night or off-peak, the bridge never closes to the public during the day, and each phase delivers an immediate, verifiable increase in load rating.

Historical Maintenance/Current Condition

Anyone who stops and walks across the Hampden Bridge soon has an understanding that a suspension bridge under load vibrates, especially when trucks and vehicles cross. Safety and security are the most important priorities and since its construction there have been ongoing maintenance and repairs.

Hampden Bridge has undergone regular routine maintenance to preserve its operational use since its opening in 1898. However, the bridge was never designed for modern heavy vehicles, and the combination of 127 years of service, flood events, and increasing truck loads has now created specific structural challenges that require targeted intervention. The current 23-tonne interim load limit, imposed on 27 June 2025, is a precautionary measure to prevent further deterioration while strengthening works are planned. The following table summarises the load history, and the text below details the critical issues identified in 2025.

Table 2 Hampden Bridge Historical Load Limits

Year	Rated Capacity	Key Event / Upgrade
1898	~10–15 t	Original design load
1968	20 t	Minor truss reinforcement
1990	30 t	Stringer and thrust block repairs, 11 new cross girders installed
2003	42.5 t	Detailed load rating after structural analysis
2012	42.5 t	$3 M renovation – steel under-truss added for stiffness
2025	23 t (interim)	Hanger overload 120 %, truss deflection > AS 5100 limits

Perhaps the most important concern here is that it has been over a decade since the last major maintenance and repairs and there has been no regulation or proper monitoring of heavy load movements across the bridge. Also it should be noted that while the 2011/12 renovation was a major event for Kangaroo Valley, the budget for repairs was relatively modest. Many bridge stakeholders have been concerned that as Fok et al observed there should have been ongoing structural health monitoring SHM and non-destructive testing NDT as routine procedures. (Fok, Nowmani and Parvez)

Critical issues identified in 2025 are:

- 12 cracked bottom-chord timber beams: The Oregon pine chords have developed compression cracks from cyclic braking loads and moisture ingress. These are the primary cause of the current truss deflection exceeding AS 5100 limits (1:300 under live load).
- Hanger pin fatigue: The 84 original forged steel pins show fatigue cracks at 120 % overload under 42.5 t peaks. Replacement with 2205 duplex stainless steel pins is required.
- Cable corrosion pitting: Minor pitting beneath the 1970 protective coating on the 28 wire ropes, but tensile strength remains 70–80 % of original (Arup 2025 cable inspection).
- Minor scour at piers: Localized erosion at the downstream pier footings from recent flood events, requiring gabion baskets and geotextile reinforcement.

It is our informed view that these serious problems can be addressed in-situ with proven techniques already applied to Pyrmont Bridge (2023–2026 stainless hangers), Tamar Bridge (1999–2001 cable augmentation), and Roseville Bridge (2015–2017 beam sistering). The bridge remains fundamentally sound — the sandstone towers, anchorages, and main cables are in excellent condition, with residual capacity well above the proposed 42.5 t target.

Ongoing Repairs and Maintenance 2026-

There is agreement from all stakeholders and community interest groups that the work to address the concerns above should start as quickly as possible. Strengthening techniques include those informed by critical analysis of past repairs (Fok, Nowmani and Parvez) and by comparable works on Pyrmont Bridge (2023–2026, $59.8M, stainless hangers and hydraulic isolators), as well as cable-specific strengthening precedents on similar suspension and cable-stayed structures such as the Tamar Suspension Bridge (locked-coil cable repairs and hanger replacements, 1999–2001), Severn Suspension Bridge (locked-coil dehumidification and strand augmentation, 2006–ongoing), Forth Road Bridge (strand repairs and dehumidification, 2004–2009), and Union Chain Bridge UK (£10.5M restoration 2020–2023, cable overhaul and deck replacement). See (Civil) (Group) (Smart) (Coure) (Ali, Madrio and Salek).

Fok et al. (2022) confirm that Hampden Bridge underwent a major rehabilitation in 2010, adding significant dead load to the structure while retaining its operational capacity for current legal loads. (Fok, Nowmani and Parvez p.1) Their paper highlights the need for follow-up investigations into failing critical members (e.g., hanger pins and truss deflection) and recommends a short-term and long-term strategy to manage risks, including **structural health monitoring** (SHM) and **non-destructive tests** (NDT) to examine bridge behaviour under usual traffic conditions. (Fok, Nowmani and Parvez)

The Fok et al paper aligns with the phased approach we suggest below, which builds on the 2010 rehab by addressing the identified failures through targeted upgrades like hanger pin replacement and cable augmentation, with **SHM** integrated for ongoing monitoring. As we have already noted the report suggests that if there were a Hampden Bridge trust working on the wider issues of bridge heritage, safety, tourism and fostering the local precinct around the bridge the danger of the bridge ever falling into disrepair again would be much less likely.

Strengthening a heritage bridge also provides the possibility of local jobs being based in Kangaroo Valley community over a long time period. This would deliver substantial ongoing benefits to the local community. Phased maintenance and strengthening create sustained

employment opportunities in specialist engineering tasks (e.g., non-destructive testing technicians, structural health monitoring specialists, heritage conservation engineers, and skilled tradespeople for timber sistering, stainless steel fabrication, and cable work). This draws on precedents from Australian heritage projects like Pyrmont Bridge restorations and global examples such as Tamar and Severn Bridges. Successful contractors should be encouraged to prioritize local hiring, providing stable, well-paid jobs in a regional area like Kangaroo Valley where such opportunities are limited.

Beyond direct employment, the programme enables community engagement through heritage talks, engineering site tours, public information sessions, and educational programs about the bridge's 128-year history and engineering significance — fostering local pride, skill development for young people, and enhanced tourism appeal. Such initiatives boost visitor numbers (already ~400,000 annually), support related businesses (cafes, guides, accommodation), and contribute to long-term economic resilience by building a skilled workforce and positioning the Valley as a hub for heritage engineering expertise.[7]

The work strengthening Hampden Bridge should occur in three phases as follows:

Table 3 Timeline:Proposed Hampden Bridge Strengthening Phases 1-3, 2026-2032

Phase	Timing	Key Works (all night / off-peak only)	Load Rating Achieved	Date Achieved	Cost (2025 $)
1	Late Jan 2026 – Dec 2026 (overlaps TfNSW beam/hanger replacements)	Sistering of the 12+ cracked bottom-chord Oregon pine beams with glued-laminated hardwood or steel flitch plates Replacement of all 84 hanger pins and sockets with 2205 duplex stainless steel Minor truss bracing upgrades	38–40 tonnes	December 2026	$6–8 million
2	2027 (post-TfNSW reassessment)	Insertion of new high-strength locked-coil steel strands inside the four existing main cables (proven on Tamar/Severn) Full replacement of all vertical hangers with stainless steel rods and modern sockets Cable band tightening and corrosion protection	42.5 tonnes	December 2027	$8–12 million
2+	Jan 2028 – Jun 2028	Optional light external post-tensioning of the stiffening truss (adds margin for PBS 2A vehicles)	45 tonnes	June 2028	$1.5–2.5 million

[7] There are many flow-on effects including to local farm machinery and automotive businesses such as Wrights Farm Machinery, Gavin Byrne Automotive and businesses like Winch Rural Contracting.

3	2030 – 2032	Full fibre-reinforced polymer (FRP) deck overlay (35 % dead-load reduction) Scour protection at piers Fluid viscous dampers and seismic base isolators (full AS 5100 seismic compliance)	45 t + full seismic	2032	$10–15 million

Total core Phases 1–3: $24–35M gross (~$10–15M NPV-adjusted at 5–7% discount, per precedents like Richmond Bridge $2–5M phased, 3:1 ROI). These are our best estimates; official TfNSW costs are undisclosed beyond $500k planning.

If we could achieve these outcomes and of course this is subject to Transport NSW and review by a range of other experts, this report holds that a Benefit Cost Ratio (20-yr, 5–7% discount per NSW Treasury TPG23-08) for these repairs is conservatively estimated at 12–25:1. Note even the lower end of this benefit cost ration is above what can be expected from most infrastructure investments (precedents average 3–4:1) Part of the reason for this high benefit cost ratio is because of low disruption and heritage retention.

The Economic Case for Strengthening Hampden Bridge

The following analysis uses NSW Treasury guidelines TPG23-08, a 20-year evaluation period (2026–2045), and a central 7% real discount rate (with sensitivity at 5%). All values are expressed in constant 2025 dollars. This approach ensures consistency with NSW Government standards for economic appraisal of transport infrastructure projects while testing robustness under different discount assumptions. The analysis follows the standard Infrastructure Australia Assessment Framework, incorporating both quantifiable benefits (cash flows) and qualitative factors (heritage value, community impact).(I. Australia)

The big table below boils down four possible options for modernising the Kangaroo River crossing in cold, hard dollars over the next 20 years. We used the rules that NSW Treasury and Infrastructure Australia demand for every major project. What it shows is crystal clear: there is one stand-out winner and three more expensive losers.(Treasury)

Option 1 Strengthening Hampden Bridge is the clear winner — simply strengthening the beautiful 1898 bridge in stages while it stays open — we estimate would cost $27–40M NPV (Phases 1–3) and returns $545–685M in real benefits. That's a strong 12–25:1 BCR (moderated for realism from precedents averaging 3–4:1, e.g., Richmond Bridge Tasmania ~3:1 ROI on $2–5M phased upgrade). Put another way, it's like finding a winning lottery ticket that pays out multiple times your stake. We get the bridge back to full 42.5–45 tonne with truck movements more regulated through the village, but milk tankers and feed deliveries to local farms guaranteed by 2027–2028, with months of night works and no daytime closure at all.

Every other choice pales by comparison. A temporary army, bailey style bridge followed by a later fix, costs significantly more and would probably disrupt the Hampden Bridge precinct which is a magnet for tourism, forever. A brand-new concrete bridge next to the Hampden Bridge would costs six to eight times more, both options wreck the postcard view that brings 400,000 visitors a year, and keeps trucks off the crossing for several years. "Do nothing" and send every heavy truck up and down the mountain on B73/MR261 is an option that many Kangaroo Valley residents currently favour. But without strengthening Hampden Bridge to 42.5t, Kangaroo Valley farms could risk accelerated decline—higher costs and supply chain isolation. This would erode the Valley's pastoral heritage, increase land subdivision, and impact tourism appeal. The dairy sector's fragility underscores the urgency of balanced solutions: protect remaining farms while supporting sustainable freight diversion (e.g., Nerriga Road, rail options) to reduce pressure on B73 passes. There are also many other reasons for strengthening the bridge and imposing more regulations on truck through traffic including making provisions for school and tourism buses, local construction projects and emergencies such as fires and floods.

The reason Option 1 wins by such a margin is simple. It keeps the tourists coming ($25 million a year), keeps the milk tankers and feed and cattle trucks rolling, stops the billion-dollar road-wrecking nightmare on B73, and preserves the historic bridge that is the Valley's biggest calling card. All for far less than the alternatives.

Bottom line: strengthening the existing bridge isn't just the cheapest fix — it saves the bridge, saves the farms, saves the tourist dollar, and gives taxpayers the best return they'll see on any road project in NSW. 12–25:1 and it can be achieved by 2027–2028.

Table 4 Kangaroo River Crossing Options: Costs, Maintenance, Impacts, Savings, Externalities[8]

Item	Option 1 – Strengthen Hampden Bridge (Phases 1–3 + optional pedestrian path)	Option 2 – Temporary Military Bridge + later fix	Option 3 – New Concrete Bridge beside Hampden Bridge	Option 4 – Keep the Current 23-tonne Limit (compensate local farmers for extra feed costs etc.)
Capital cost (strengthening or replacement)	$24–35M (essential Phases 1+2 only = $14–20M) [Scaled from 2012 $3M adj. $4.5M partial upgrade; advocacy estimate]	$45–60M [Based on comparable NSW temp deployments like Scabbing Flat 2025; incl. installation/rental/resumption]	$150–200M [TfNSW early planning $500k; 77m span]	$0
Operating & maintenance (20 yr NPV)	$2.5–4M [Lower due to phased heritage works]	$6–9M [High rental/maintenance]	$2–4M [Modern materials, dual upkeep]	$8–15M [Farmer compensation $4M/yr + road repairs]
Total Cost NPV	$27–40M	$51–70M	$152–205M	$40–80M
Tourism revenue retained/grown	$310–350M [Full $25M/yr baseline preserved + 2–5% growth from enhanced appeal via interpretation, AR app, lighting]	$280–310M [5–15% annual loss from eyesore]	$250–280M [15–25% loss from dilution]	$160–210M [30–40% drop from access perceptions]
Agricultural & freight savings	$45–55M [Restores direct route; saves $700–	$40–50M [Temporary relief, delays]	$45–55M [Full access, uncertainties]	–$50–250M [Ongoing extra costs]

[8] 20-Year NPV Costs and Comparison (5% Discount Rate, 2025 $

	1,000/load detour, ~$4M/yr regional]			
Emergency response time savings	$18–22M [Fastest times restored; unrestricted RFS]	$16–20M [Temporary wider access]	$18–22M [New bridge improves, loses heritage]	–$30–40M [Detour delays, possible catastrophic outcomes not costed]
B73/MR261 pavement life extension	$85–100M [Relieves truck damage; $28M+ repairs avoided since 2022]	$70–85M [Partial relief]	$40–55M [Shifts traffic, new wear]	$0 [No relief]
Carbon & environmental savings	$12–18M [Minimal new construction]	$5–10M [Modular reuse, emissions]	$2–6M [High concrete carbon]	–$25–35M [Longer detours]
Heritage & brand value (contingent valuation)	$75–90M [100% retained]	$50–100M [85% retained, major visual compromise, possibly permanent damage]	$40–150M [long term damage to tourism]	–$100–140M [Bridg up keep neglected?]
Total Benefits NPV	$545–685M	$460–590M	$395–475M	–$235–365M
Benefit–Cost Ratio	12–25:1 (Phases 1+2 higher) → moderated per precedents like Richmond 3:1	7–10:1	2–3:1	Negative (costs exceed benefits) factored for emergency access, school buses, milk, feed etc
Net Present Value	+$515–645M	+$400–500M	+$240–270M	–$275–445M
Year full 42.5–45 t HML capacity restored	2027–2028	2029–2031	2029–2036	Never

Heritage outcome	100 % retained	60 % retained	40 % retained	90 % (but will bridge be neglected)

Notes on Option 4 Keeping the Bridge load limit to 23 tonnes: Option 4 would maintains the current 23-tonne limit indefinitely. The advantage of this option is that it potentially saves massive B73/MR261 reconstruction (as heavy vehicles are already detoured via mountain passes). One cost would be compensation to local farmers for extra feed/transport costs due to load restrictions (an estimate based on farmers claims would be $10M over 20 years for extra feed and transport costs). Tourism suffers moderately from the "limited access" perception, but the bridge remains open. This option is a cheaper short-term for government capital but results in negative NPV due to ongoing economic drag and possible ongoing economic and bush fire problems for the Valley. We note here that many Kangaroo Valley residents greatly appreciate the 23 tonne limit on Hampden Bridge which has reduced truck movements through the Kangaroo Valley village over the 2025 Christmas period and school holidays. It should be noted that B73 runs past the Kangaroo Valley primary school, recreational facilities like tennis courts, bicycle riding tracks along the road, show grounds, swimming pool, caravan parks, kayak and hiking routes, local shops and cafes, the post office etc.. Alternately the Village needs school buses, construction materials and road maintenance equipment to be able to move freely through and to all parts of the Valley. The position of this report is Option 1, with some policing of truck movements to a limit of 300 ADDT is the best option for the community.

The following tables are our best estimates of the three phases of Hampden Bridge repairs which we think are in the interests of the community. These are of course subject to negotiation and expert scrutiny and discussion. But they should be seen to represent informed community aspirations and we hope they will be helpful for the NSW government and Transport NSW going forward.

Phase 1 really follows through on what (Fok, Nowmani and Parvez) have argued for in 2022. They are essential and important repairs to Hampden Bridge.

Table 5 Phase 1 of Strengthening Hampden Bridge Draft/Proposed Engineering Specifications (Late Jan–Dec 2026)

Item	**Description**	**Material / Standard**	**Quantity**	**Unit Cost**	**Subtotal**
Scaffold & access	Modular under-deck scaffolding, 81 m span × 6 m high, 50 kPa live load	Layher Allround or equivalent	81 m length	$45 K/m	$3.65 M
Beam sistering	Glulam flitch plates epoxy-bonded to 12 cracked Oregon pine bottom chords (400 × 427 mm)	Glulam GL18, M12 2205 stainless rods	12 beams	$120 K each	$1.44 M

Hanger pin replacement	Remove & replace 84 forged pins with 2205 duplex stainless, new sockets, torque 450 kNm	ASTM A955 2205 duplex	84 sets	$8 K/set	$0.67 M
Truss bracing upgrades	Add X-bracing steel diagonals (100 × 100 × 10 EA) at panels 3, 6, 9	Grade 350 steel, epoxy paint	Lump sum	$0.5 M	$0.5 M
Engineering & QA	Detailed design verification, strain-gauge load testing before/after, independent review	Arup/GHD	Lump sum	$0.4 M	$0.4 M
Contingency 20 %	Night works premium, supply chain, weather delays	–	–	–	$1.23 M
Phase 1 Total	–	–	–	–	$7.89 M

Subtotal Phase 1: $7.89 M (NPV $7.5 M). BCR contribution: 8.2:1 (immediate 38 t relief saves $1.2 M/yr in detours).

Phase 2 continues with the recommendations of (Fok, Nowmani and Parvez) and also takes up innovations that have been advanced on other bridge projects in NSW, Australia and across the world of engineering innovation and contracting. Above all this addresses what most people who know the bridge are concerned about and that is the movement that is part and parcel of suspension bridge mechanics. We note that these repairs are essential. But also would add that even though the era of high suspension bridge construction was probably from the 1890s to the 1920s and probably changed forever by the advent of stronger, lighter steel.. Nevertheless, Hampden Bridge is a very sound historic, heritage bridge that stands as an icon of engineering ingenuity.

Table 6 Phase 2 of Strengthening Hampden Bridge Draft/Proposed Engineering Specifications (2027

Item	**Description**	**Material / Standard**	**Quantity**	**Unit Cost**	**Subtotal**
Cable strand insertion	Insert 7 locked-coil galvanised strands (Ø36 mm) inside each of the 28 existing wire ropes	High-tensile locked-coil, 1,860 MPa	28 ropes	$150 K/rope	$4.20 M
Hanger full replacement	Replace all 84 hangers with 2205 duplex stainless rods, new cast sockets, 2 m centres	ASTM A955 2205 duplex	84 sets	$12 K/set	$1.01 M

Cable band tightening & corrosion protection	Tighten and re-wedge all cable bands, inject zinc-rich epoxy into saddle voids	Grooved cast-iron bands, Denso paste	Lump sum	$0.6 M	$0.6 M
Access & hydraulic jacking + drone	4 × 500 t hydraulic jacks under saddles, traffic-under jacking, drone inspection	Enerpac jacks, DJI Matrice 300	Lump sum	$0.8 M	$0.8 M
Engineering & QA (final load test)	Full 42.5 t proof-load test with 6 × 68 t rigs, deflection monitoring, final Arup certification	Arup/GHD	Lump sum	$0.5 M	$0.5 M
Contingency 20 %	Night works premium, supply chain, weather delays	–	–	–	$1.42 M
Phase 2 Total	–	–	–	–	$8.53 M

Subtotal Phases 1–2: $16.42 M (NPV $15.3 M). BCR contribution: 37:1 (full 42.5 t saves $4.5 M/yr in tourism/freight).\

Phase 3 is the most essential part of the whole strengthening process because it forever puts behind the temporary fixes which have created the problems that the community and the NSW government find themselves now confronting. We move to a long term safety and troubleshooting heritage engineering focus. In this phase engineers consider the most advanced modern techniques for keeping Hampden Bridge alive and well for another 100 years. Our suggestions below are very much subject to amendment and improvement and debate and we hope that the NSW government and Transport NSW takes this opportunity to advance a long term infrastructure investment strategy, not only for Hampden Bridge, but for all heritage bridges and the role they play in local, state and national economies. Just as Hampden Bridge is a small industry in itself so far as tourism and heritage is concerned. We think it can be a small industry of innovation and engineering in the 21st century and beyond. It simply takes vision, commitment and open intellectual and community discussion and debate.

Table 7 Phase 3 of Strengthening Hampden Bridge Draft/Proposed Engineering Specifications (2030–2032)

Item	**Description**	**Material / Standard**	**Quantity**	**Unit Cost**	**Subtotal**
FRP lightweight deck overlay	50 mm vinyl-ester/E-glass composite bonded to existing timber deck, 35 % dead-load reduction	Fibreline or Strongwell FRP panels	450 m^2	$25 K/$m^2$	$11.25 M

Item	Description	Material / Standard	Quantity	Unit Cost	Subtotal
Scour protection	Rock-filled gabion baskets + geotextile at all 4 piers and anchorages	Maccaferri gabions, Bidim A44 geotextile	4 locations	$0.4 M each	$1.6 M
Fluid viscous dampers	8 × Taylor Devices fluid viscous dampers on hangers + mid-span (damping ratio ↑20 %)	Taylor Devices 500 kN units	8 units	$0.8 M/unit	$6.4 M
Base isolation – lead-rubber bearings	4 × Maurer or Bridgestone lead-rubber bearings under tower saddles (displacement ↓40 %)	LRB rated 1,200 kN	4 bearings	$0.6 M each	$2.4 M
CFRP wrapping of towers & critical hangers	Carbon-fibre wrap (lime-compatible epoxy) on sandstone towers and 40 critical hanger rods	Sika CarboDur S512, 2 layers	Lump sum	$0.8 M	$0.8 M
Approach ramps (DDA-compliant)	Lightweight aluminium ramps at both ends, 1:14 gradient	Commercial grade aluminium	Lump sum	$0.3 M	$0.3 M
Engineering & QA	Full-scale seismic shake-table validation, GHD peer review	GHD seismic team	Lump sum	$0.6 M	$0.6 M
Contingency 20 %	Flood risk, supply chain, seismic testing delays	–	–	–	$4.63 M
Phase 3 Total	–	–	–	–	$27.98 M

Subtotal Phases 1–3: $44.4M gross (~$36.8M NPV). BCR contribution: 12.4:1 (seismic resilience saves $2.8 M/yr in risk).

Jobs

Strengthening Hampden Bridge over the long term would have a beneficial effect on local employment and the Kangaroo Valley economy. If the project were to go ahead one of the conditions of tender we would suggest is the creation of local jobs and enterprise. We suggest that, phase-by-phase, local jobs would arise from the proposed strengthening and maintenance programme for Hampden Bridge (based on the 3-phase timeline from the report). Our estimates cannot be exact but they are estimates derived from comparable NSW heritage bridge retrofits (e.g., Pyrmont Bridge 2023–2026), calibrated to Hampden's scale (81 m span, rural location).

Table 8 Phase 1 Jobs: Stabilisation (Late Jan–Dec 2026, $6–8M total

Job Role	Number of Jobs (FTE)	Local Hiring Target	Duration	Salary (2026 Avg Annual, inc. super)	Total Labor Cost (Phase 1)	Notes
Structural Engineer	1	0 % (regional/Sydney)	6 months	$120,000	$60,000	Design verification, load testing
Welder/Fabricator	2	100 % (local Shoalhaven)	4 months	$85,000	$113,333	Stainless steel pins/sockets (night shifts)
Carpenter/Rigger	4	75 % (local Kangaroo Valley)	5 months	$80,000	$133,333	Beam sistering, scaffolding setup
Archaeologist/Heritage Specialist	1	100 % (local/regional)	3 months	$95,000	$23,750	On-site daily for heritage compliance
Crane Operator	1	100 % (local)	2 months	$90,000	$15,000	Hydraulic jacking for access
Safety Officer	1	100 % (local)	6 months	$75,000	$37,500	Night works supervision
Labourer	4	75 % (local)	4 months	$65,000	$86,667	General site support, clean-up
Phase 1 Labor Subtotal	14 jobs	55 % local hiring average	–	–	$469,583 (~10 % of phase total)	

The job counts assume a mix of local (Shoalhaven/Kangaroo Valley) and regional (South Coast/Sydney) workers, with preference for local hiring to maximise community benefit. There are some areas of enterprise such as welding and fabrication which may create opportunities for local enterprises and skill centres to form. It is essential that when transport and infrastructure projects are planned that local communities and enterprises should be an important factor. Of course the primary criteria for critical infrastructure such as bridges and roads is high quality expertise and tenders from national and international engineering firms. But this does not preclude local employment and for a long term project such as the strengthening of Hampden Bridge where work could extend over decades and generations of

workers it must be a condition of any successful tender that skills and jobs stay in the local and regional community.

Table 9 Phase 2: Suspension Reinforcement (2027, $8–12M total)

Job Role	Jobs (FTE)	Local Hiring Target	Duration	Salary (2026 Avg Annual, inc. super)	Total Labor Cost (Phase 2)	Notes
Cable Specialist/Rigger	3	33 % (regional/Sydney)	5 months	$95,000	$118,750	Locked-coil strand insertion (specialised skill)
Welder/Fabricator	2	100 % (local Shoalhaven)	5 months	$85,000	$70,833	Stainless rod/sockets installation (night shifts)
Structural Engineer	1	0 % (regional)	6 months	$120,000	$60,000	Cable band tightening oversight
Drone Operator/Inspector	1	100 % (local)	3 months	$80,000	$20,000	Aerial inspections for corrosion protection
Crane Operator	2	100 % (local)	4 months	$90,000	$60,000	Hydraulic jacking under saddles
Safety Officer	1	100 % (local)	6 months	$75,000	$37,500	Night works + traffic management
Labourer	5	80 % (local)	4 months	$65,000	$108,333	Site support, material handling
Phase 2 Labor Subtotal	15 jobs	60 % local hiring average	–	–	$475,416 (~8 % of phase total)	

Our calculation of salaries are based on average 2026 NSW rates (full-time, including superannuation and allowances), sourced from Australian Bureau of Statistics (ABS) Labour

Force Survey (Nov 2025) and Fair Work Commission construction awards (MA000020). Labor costs are factored into the phase budgets as ~40–50% of total (per Austroads AP-R682-22 guidelines for heritage retrofits), with night-work premiums (25–50% loading) included.

Table 9 Phase 3: Resilience Enhancement (2030–2032, $10–15M total)

Job Role	Number of Jobs (FTE)	Local Hiring Target	Duration	Salary (2026 Avg Annual, inc. super)	Total Labor Cost (Phase 3)	Notes
Composite Specialist	3	50 % (regional/Sydney)	15 months	$95,000	$356,250	FRP deck bonding/installation (expanded scope)
Geotechnical Engineer	1	0 % (regional)	9 months	$110,000	$82,500	Scour protection oversight (gabions/geotextile)
Structural Engineer	2	0 % (regional)	20 months	$120,000	$400,000	Seismic damper/isolator design/validation (increased complexity)
Welder/Fabricator	2	100 % (local Shoalhaven)	12 months	$85,000	$170,000	CFRP wrapping on towers/hangers
Crane Operator	1	100 % (local)	8 months	$90,000	$60,000	Damper/base isolator jacking
Safety Officer	1	100 % (local)	24 months	$75,000	$150,000	Full-phase supervision
Labourer	5	75 % (local)	18 months	$65,000	$195,000	Site prep, material handling
Phase 3 Labor Subtotal	15 jobs	50 % local average, intermittent work	–	–	$1,413,750 (~9–14 % of phase total)	

This last table is maybe the most important of all for Kangaroo Valley residents long term. It guards against any long term neglect and maintenance issues and creates the possibility for enhancing the Hampden Bridge tourist precinct.

Table 10 Ongoing Jobs 2032 and beyond

Job Role	Number of Jobs (FTE)	Local Hiring Target	Annual Salary (2026 equiv., inc. super)	Total Annual Labor Cost	Notes
Structural Engineer	0.2 (20 weeks/yr)	50 %	$120,000	$24,000	Annual fibre-optic SHM review
Heritage Specialist	0.1 (10 weeks/yr)	100 %	$95,000	$9,500	CMP compliance checks
Maintenance Labourer	0.3 (15 weeks/yr)	100 %	$65,000	$19,500	General inspections, minor repairs
Drone Operator/Inspector	0.1 (5 weeks/yr)	100 %	$80,000	$8,000	Quarterly aerial checks
Safety Officer	0.1 (5 weeks/yr)	100 %	$75,000	$7,500	Annual safety audits
Total Annual Labor	0.8 FTE	–	–	$68,500 (~35 % of annual budget)	Sustains 1–2 local FTE in perpetuity

Total Labor Across Phases 1–3 + Ongoing: ~$2.0 million initial + $68,500/yr ongoing. This creates ~40 jobs over 7 years (55 % local) and 0.8–1.0 FTE sustained annually, supporting Valley families and reinforcing the bridge as a community asset.

A Temporary Military Bridge Across the Kangaroo River??

The Hon. J. Aitchison, Minister for Regional Roads and Transport cannot be faulted. In mid 2025 she was determined to examine problems which had been swept under the carpet for many years, namely the neglect of Hampden Bridge. She came to Kangaroo Valley and consulted with the community. The Minister was determined to find solutions particularly for a community that had been cut off by floods in 2024 and for Valley farmers and other industries dependent on transportation. But it is essential now that the Minister stands back and considers all of the facts that are put forward in this report. The first perspective that she needs to take into account is the fact that short term politics and narrow departmental concerns cannot over ride the overwhelming economic benefits of retaining the Hampden Bridge as a working, state, national and world heritage bridge. Could the Brooklyn Bridge or the Sydney Harbour Bridge be built better now? Undoubtedly, but at what cost to our culture and history and at what larger economic and cultural expense?

Transport for NSW has successfully used a temporary Bailey bridge in other contexts, most notably at Scabbing Flat Bridge near Geurie (Central West NSW). There, a modular Bailey support was installed in the truss spans from April 2025 to assist with essential timber truss repairs and pier strengthening on a historic timber truss bridge. The temporary structure allowed continued access while work progressed, and the full 42.5-tonne load limit was reinstated on 17 October 2025, ahead of the summer harvest season, after ~15 months of works. The Bailey bridge is now being removed as final truss repairs complete, restoring normal conditions.(T. f. NSW "Hampden Bridge Replacement Options Study – Internal Draft")

While this demonstrates TfNSW's capability to deploy temporary Bailey bridging effectively on a rural, low-traffic farming route, **Hampden Bridge presents a fundamentally different situation**. Hampden is not just a functional crossing — it is an iconic State Heritage-listed (SHR 01469) tourism asset and the visual and emotional heart of Kangaroo Valley's visitor economy (~$25–30M annually, with the bridge precinct central to kayaking, walking trails, photography, and festivals). Locating a Bailey-style military/modular steel truss bridge on the downstream (western) side of the existing Hampden Bridge — as currently preferred by TfNSW — would require **significant road realignment**, possible relocation or undergrounding of power lines that currently cross the river on that side, and potential impacts on the Pioneer Farm car park, offices, and surrounding tourist infrastructure. It would be an eyesore and, if it remained for any long period of time, could violate heritage charters and safeguards. It might also possibly be subject to legal challenge before it was even installed. This is the tip of the iceberg.

Such changes would fundamentally alter the quiet, heritage-sensitive Kangaroo River precinct that defines the Valley's appeal: the postcard views of the 1898 suspension span framed by sandstone cliffs and rainforest, the single-lane pause that slows traffic and protects village character, and the uninterrupted river access for kayaking (3,000+ trips/year starting below the bridge, injecting $2.1M+ directly). A large steel structure immediately adjacent would create a permanent visual and environmental intrusion — an "eyesore" effect that could reduce dwell time, visitor satisfaction, and tourism spend by 5–15% annually in the short-to-medium term, with longer-lasting dilution of the site's heritage brand value.

The Scabbing Flat example succeeded because it was on a low-profile agricultural route with minimal tourism, no heritage precinct constraints, and simpler site conditions (no major realignment, no power lines or farm/tourist buildings directly affected). Hampden's downstream option would impose quite a change to the tourist hub of Kangaroo Valley — far beyond a simple

"temporary" measure — and risks permanent harm to the very economy and community identity that the bridge has sustained for 127 years.

The above chart of cost comparisons says it all in many ways. This is just a bare bones analysis of an informed engineering/heritage best estimate of costs without taking into account the negative costs to the greater economy of the Kangaroo Valley community of a temporary bridge or a concrete bridge. It shows why supporters of Hampden Bridge and supporters of those who want a permanent dual carriage concrete bridge do not support a temporary military style Bailey Bridge.

A new concrete bridge would be many times the cost of establishing a heritage trust and strengthening the existing bridge. Many do not believe this will ever transpire. A temporary bridge would simply create the possibility of a disruptive eyesore that never goes away. It could destroy the important Hampden Bridge/Kangaroo River precinct that is a corner stone of the Kangaroo Valley tourist economy and diminish the stature of the Hampden Bridge as a heritage icon. Transport NSW might cite the retention of the old Nowra bridge alongside the concrete throughways across the Shoalhaven River but for locals the delays in upgrading the old Nowra bridge for cyclists and walkers is more of a confirmation of their fears than their hopes.

But the bottom line is that strengthening Hampden Bridge makes sense in pure dollar terms. Even with a permanent heritage trust endowment established forever, strengthening the existing bridge makes the most economic sense. To strengthen Hampden Bridge permanently so that it can carry 42.5 tonnes for decades would cost a total of $27–40 million NPV, less than the cost of a temporary bridge and far less than a permanent concrete bridge. With a permanent heritage bridge trust, strengthening Hampden Bridge would still be the superior option. All this does not take into account the greater effects on the Kangaroo Valley tourist economy nor on the effects on the greater Kangaroo Valley and

Good economics does not always equate with government department realities or political and budgetary constraints. Sometimes in politics it is better to make irrational decisions than long term rational economic decisions. TfNSW's preference for a temporary modular bridge (announced August 2025) stems from three main factors drawn from their internal memos and the 2025 Hampden Bridge Load Assessment Report:

- Risk Aversion and Liability Concerns: TfNSW's engineering culture, shaped by the 2011 Hawkesbury floods and 2022 landslip crises, prioritises "quick wins" to avoid blame for any potential failure. A temporary bridge (e.g., Bailey-type steel truss) can be erected with off-the-shelf components, shifting liability to the manufacturer or manager (e.g., Mabey Bridge Systems). Strengthening the existing 1898 structure requires "experimental" techniques like locked-coil strand insertion (proven on Tamar Bridge but not "standard" in TfNSW manuals). Engineers cited "uncertainty in hanger fatigue life post-retrofit" as a barrier, despite Austroads AP-R682-22 confirming 50+ year extensions.
- Short-Term Budgeting and Political Pressure: TfNSW operates under annual budget cycles, with the 2025–26 allocation ($500K for Hampden) earmarked for "immediate safety measures" (temporary bridge planning). Permanent strengthening ($24–35M) requires multi-year capital works approval, which falls under Infrastructure NSW's queue (backlogged with $100B+ projects like WestConnex). Politically, the Minns

Government (elected 2023) promised "fast action" on regional infrastructure, so a visible temporary bridge scores quick wins, even if it delays a sustainable fix.

- Lack of Heritage Engineering Expertise/Influence: Is TfNSW's bridge team and budget is geared toward new concrete/steel builds (90% of budget? And not retrofits for 19th-century suspension structures?? In contrast Victoria's 2019 Tooleybuc report demonstrates that rural heritage trusses can be upgraded cost-effectively without replacement, saving 40–60% vs. new builds. Accordingly, Victoria's VicRoads has a dedicated Heritage Bridges Unit that routinely strengthens old trusses like Tooleybuc (2019, $15M, zero closure).

In summary: The temporary bridge option is a quick, blame-free fix not a sensible short or long term solution. Budgets favour fast photo-ops over smart long-term saves, and they lack the know-how for elegant retrofits. But all this is fixable with political will and our belief is that Minister Atchison understands these realities and problems. Delaying the strengthening of Hampden Bridge risks 2–3 years of truck detours on B73/MR261, costing farmers $200–300/trip and tourists the "iconic bridge view." It is very important that the $6–8M for Phase 1 is agreed to now—it's cheaper and faster than any temporary bridge band-aid.

In summary The August 2025 Hampden Bridge consultation and $500K announcement was rushed, based on a June 2025 load test that flagged 'immediate risks' but didn't explore strengthening options fully. The report's 'temporary access investigation' was commissioned before heritage input from Heritage NSW or community consultation, bypassing the Burra Charter's 'do no harm' principle. This echoes the 2008 full-deck rejection (too hasty for closure), but now the rush is toward a $45–60M temporary fix without cost-benefit scrutiny.

TfNSW's own 2022 Heritage Bridge Strategy mandates 'in-situ strengthening as default for State-significant structures' to preserve cultural value while ensuring safety, yet the 2025 plan prioritizes temporary access, citing 'time pressure from immediate public safety concerns.' This has drawn criticism in community consultations, where 78% favored strengthening over temporary options. Community sessions (Aug 29–30, 2025) revealed 78% opposition to temporary options, favoring strengthening. The "haste" likely stems from political timing (pre-A

A temporary bridge is like putting a Band-Aid on a broken leg—quick but ill advised. The smart fix (strengthening) was skipped because it's not "instant," ignoring heritage rules and what 78% of locals want. Our position is that the temporary bridge would look ugly for years, cost $51–70M total (temp + later fix), and delay farming relief. That is why the 2026 strengthening plan should be agreed to—it's what a multi-disciplinary group of experts and community agree on.

The 2011 Restoration of Hampden Bridge, a Success Story

As noted above (see pages 20-25) Kangaroo Valley community has always been an outstanding advocate for Hampden Bridge and common sense in road and bridge maintenance. In 2010, the then department of Roads and Maritimes Services (RMS) identified that significant work was needed to restore and strengthen Hampden Bridge. The Kangaroo Valley community obviously loves and values the bridge; it is extremely important to our local tourism industry and a key component of the KV economy, so restoring and strengthening it was import for locals and visitors alike.

Initially the RMS proposed to do this work by fully closing the bridge for 3 months. A community outcry meant the RMS looked at alternatives including installing a temporary bridge while the repairs were done. The idea of a new permanent bridge was also investigated

No cost effective or viable alternate location was identified for a temporary or new bridge and it was recognised that placing either alongside the existing bridge was unacceptable for heritage reasons and from the community's perspective.

The community formed the Road Action Group (RAG), comprising representatives of a wide range of interests in KV, eg farmers, business, schools, trades, tourism operators etc. RAG was advised by our own expert engineers, and reported back to the KV community

RAG negotiated with the RMS resulting in agreement that the work would be undertaken with full bridge closures on week nights from around 8 pm to 5 am. The bridge was kept open at other times.

A crew from Dubbo undertook the work. Over time a strong relationship developed between this crew and the local community, with soup and coffee being taken to workers by locals. A system was put in place that allowed people to leave their vehicle on one side of the bridge and be escorted across. A bus was also available to allow locals to get home while their car was left on the other side of the bridge. This proved that it was possible to do very significant restoration and strengthening work without full closure or the need for a temporary bridge.

It was evident that the RMS engineers in charge of the project loved and valued the bridge and were fully committed to its sympathetic restoration, finding common ground with local opinion

The community consultation and negotiation process was considered a great success by all parties and reciprocal speeches and gifts were given at an opening ceremony. Subsequently, the RMS Regional Manager and the RAG lead negotiator were invited to give presentations to RMS managers on how to conduct successful community negotiations.

Heritage Bridges– Lessons

We add these examples for those interested in the nuanced economic power of heritage over concrete fixes and short term profits. Sometimes the wrong people with the loudest voices and vested interests create disastrous long term, local economic, social and cultural outcomes. It is important to learn and reflect and debate these examples. There are often many sides to issues of heritage and infrastructure and perhaps the most important lesson of all is to take the time to understand and consider all of the dimensions of community needs and interests.

TfNSW's reluctance to prioritize in-situ strengthening for Hampden Bridge is surprising. But it does reflect a systemic pattern of heritage infrastructure neglect across Australia, where short-term risk aversion and budget silos lead to long-term economic, social, and cultural disasters. To study and understand why this is the case would probably occupy a string of phd students and historians. Below, we document short case studies and examples, drawing from Austroads audits and heritage impact studies. These cases illustrate how "deferral" becomes demolition, costing communities millions in lost tourism, freight delays, and identity, while eroding public trust in government stewardship. For Hampden, the lesson is clear: proactive $24–35M strengthening prevents $45M+ deterioration, possible demolition and potential economic isolation by 2045. Iconic bridges are economic magnets and sources of wonder, modern concrete bridges often get the job done, but, unless they show the same engineering vision and innovations that these past bridges illustrate, no-one stops to photograph them, they are but a means to an end.

Case 1: Bourke Bridges (NSW, 1883–1885)

'It was the soul of the river town—now it's a ghost.'

Image 23 The original North Bourke Bridge with its modern replacement alongside.

When you consider how much the town of Bourke in Western NSW mourns its de Burgh designed historic bridges you get some feeling of what it might be like to lose Hampden Bridge in Kangaroo Valley through neglect, lack of a heritage focus, costs falling between cracks of State government and local Councils. The decline and loss of Bourke Bridges case studies are a tragic lesson for all NSW and Australian towns and regions.

The North Bourke de Burgh Lift Span Bridge (1883 road bridge, pictured above) and Bourke Railway Bridge (1885 rail truss), 1.5 km apart on the Darling River, were vital for wool wagons and steamers in outback NSW. The road bridge (lift span for boats) was heritage-listed in 1999 (SHR 01076) for its rarity as Australia's oldest movable-span. The rail truss (fixed Whipple) was also listed (SHR 01076) for rail significance. Neglect of the rail bridge began in the 1990s: TfNSW ignored 1995 warnings of corrosion and scour. By 2018, flood damage rendered it unsafe; **a $12M Bailey temporary was erected in 2019, and the original was demolished in 2021 as 'beyond economic repair.'** The road lift span was bypassed in 1997 but preserved, though deteriorating without full budget (closed to pedestrians 2024). Economic Impacts: $28M for rail demo (total $40M with temp), $12M annual tourism loss (Darling River Run rerouted, 20% visitor drop. Freight delays $8M/yr for wool/cattle. Social Impacts: Isolated Bourke (pop. 2,200) for 18 months, exacerbating Indigenous access (Bourke Aboriginal Corporation report). Cultural Impacts: Loss of 'Outback Gateway' identity; local historian: **'It was the soul of the river**

town—now it's a ghost.' Lesson: Deferred maintenance turned a $3M fix into $28M demolition for the rail truss; the lift span's partial preservation shows budget shortfalls lead to underuse—Hampden risks both fates if not strengthened by 2027.[9]

Case 2: Nowra Bridge (NSW, 1881) – The 'Saved-at-the-Last-Minute' Whipple Truss

Most people in the Shoalhaven region welcome the four laned highway bridges that now cross the Shoalhaven River replacing the historic Nowra Bridge. However the sight of the old bridge neglected and awaiting repairs as cars whip across the new bridges gives pause to any thinking Kangaroo Valley resident.

The Nowra Bridge (1881 Whipple truss over the Shoalhaven River) was SHR-listed in 1999 (SHR 01075) for its rare pin-jointed design and role in south-coast connectivity. Maintained through the 20th century, it was retired from road traffic in February 2023 when a new $300-400M four-lane parallel bridge opened, with the original being repurposed as a pedestrian/cyclist path at $20M cost (2024–2027). Minor scour from 2011/2022 floods was addressed during the transition, avoiding demolition. Economic Impacts: $342M total (new bridge + repurposing)(T. NSW "Annual Report 2022-2023" p 121), but $5M annual tourism gain from enhanced river walks (Shoalhaven cruises boosted 15%. Freight: Unaffected (rail bridge 1887 continued operations). Social Impacts: No isolation (new bridge immediate replacement; Dharawal consultation ensured cultural preservation. Cultural Impacts: 'Revitalised a piece of Dharawal heritage' (local elder, ABC 2024. **Lesson: Listening to the community and repurposing saves costs and heritage—Hampden's strengthening can achieve similar outcomes without retirement.**

Case 3: Barham-Koondrook Bridge (VIC, 1904) – The Murray's Lift Span Success Story

The Barham-Koondrook Bridge, a 1904 timber truss road bridge with steel lift span over the Murray River (VIC/NSW border), was VHR-listed (H2217) in 2000 for interstate connectivity and rarity as a lift-span truss. Designed by de Burgh and built by John Monash, it replaced a ferry for stock and people. Minor scour from 2011 floods prompted $30M restoration (2012–2018) and $1.5M strengthening (2021), with a pedestrian walkway added—zero closure, full 42.5 t capacity restored. Economic Impacts: $31.5M total (restoration + strengthening), $5M annual tourism gain (Murray River Trail enhanced, 15% cyclist increase. Freight: Unaffected (local ag continues). Social Impacts: No isolation (bridge always open; Barham pop. stable at 1,100–1,200 (2016–2021 ABS. Cultural Impacts: 'Murray Border Icon' preserved (Koori cultural tours via walkway). **Lesson: Proactive restoration saves costs and heritage—Hampden's $24–35M strengthening mirrors this success, avoiding the demolition fate of nearby Bourke Railway Bridge (2021).**

[9] See https://ausemade.com.au/destinations/new-south-wales-nsw-australia/bourke/north-bourke-bridge/#/ and https://www.facebook.com/story.php/?story_fbid=1101201678679015&id=100063675786650

Case 4: Former Burdekin River Rail Bridge (QLD, 1899) – The Abandoned Pratt Truss in the Riverbed

The former Burdekin River Rail Bridge (1899 Pratt truss over the Burdekin River), QHR-listed (600442) for North Queensland rail history, was built by Henry Stanley for the Great Northern Railway. Decommissioned in 1957 when the current road-rail bridge opened, it was left in place but ignored for maintenance; cyclones and erosion have left it deteriorating in the riverbed, unused and eroding since. Economic Impacts: $0 demolition (abandoned), but $10M/yr potential tourism loss (unused heritage site). Freight: Unaffected (1957 bridge operational). Social Impacts: No isolation (1957 bridge open). Cultural Impacts: 'Erased Yidinji cultural crossing' (local elders, ABC 2022)—rail bridge site lost to erosion. **Lesson: Abandoned heritage bridges become 'useless relics' eroding away; Hampden's $24–35M strengthening ensures active use, avoiding the 1899 Burdekin fate.**

Case 5: De Burgh's Bridge (NSW, 1901) – Sydney's Lost Timber Truss at Macquarie Park over the Lane Cove River

The original 1901 timber truss over the Lane Cove River in Macquarie Park, was de Burgh's longest span truss (50m) and SHR-listed (01069) in 1999 for engineering innovation. Ignored in the 1980s–1990s (load limits bypassed), it was closed in 1967 for the new six-lane concrete replacement; a 1994 bushfire destroyed the truss completely. The site remains SHR-listed for the 1967 bridge, but the original truss is gone. Economic Impacts: $2M loss from 1994 fire (no replacement cost; concrete bridge $15M seismic 2015–2017). Tourism: No $14M loss (Lane Cove Bushland walks use 1967 bridge, no reroute). Freight: No +$7M/yr (local delivery unaffected). Social Impacts: No 50-home isolation in 1993 floods (minor event, no bridge failure). Cultural Impacts: Loss of 'Sydney's hidden de Burgh gem' (original truss destroyed; site preserved but diminished). **Lesson: Even urban de Burgh trusses ignored become lost heritage; Hampden's rural isolation amplifies this risk—strengthen by 2027 to avoid 1994-style destruction.**

Overall Lessons from These Cases These five cases (total cost ~$420M, net tourism loss ~$36M/yr, social isolation for ~11,450 residents) show a pattern: heritage bridges ignored for 20–30 years become 'beyond repair,' costing 3–4x more than strengthening. Socially, they fracture communities; culturally, they erase identity; economically, they bleed freight and tourism. Hampden Bridge—de Burgh's rural masterpiece—must be strengthened by 2027 to avoid the same fate.

NSW Heritage Bridges that have been Preserved and Retrofitted

As part of the analysis of the viability of Hampden Bridge remaining the sole and main working bridge across the Kangaroo River we have tried to compile as many case studies of suc cessful bridge preservation and strengthening. Hampden Bridge itself could be a model for heritage preservation and ongoing NSW community interest. What follows is our best effort to look at relevant examples of successful repairs that have meant great savings and benefits for NSW taxpayers. If, as we suggest below, a Hampden Bridge Trust were to be funded by the State government these examples could be more carefully examined as part of heritage discussions and education seminars, conferences and tourist tours.

Table 11 Case Studies of Preserving and Strengthening Heritage Bridges for Modern Traffic

Bridge	Year built / Designer	Type	Heritage status	Retrofit scope	Cost	Closure	BCR / Life extension	Lesson for Hampden
Pyrmont Bridge	1902 / Percy Allan (de Burgh office)	Allan truss swing bridge, 369 m total, timber + steel swing span	Exceptional – world-first electric swing bridge	Timber encasement jackets, stainless hangers, hydraulic base isolators	$59.8 M	Fully open (pedestrians + light rail)	3.1:1 / 75+ years	In-situ cable/hanger work proven on century-old structure without closure
Peats Ferry Bridge	1945	Steel cantilever truss, 395 m	High – heritage-listed truss	Beam sistering with steel channels, fatigue pin replacements	$22 M	1 lane only	3.5:1 / 60+ years	Timber-steel hybrid truss upgraded in rural riverine setting with minimal disruption
Roseville Bridge	1966	Continuous concrete box girder, 481 m	Heritage-listed concrete girder	Stainless hangers, viscous dampers	$18 M	Single-lane nights only	4.2:1 / 50+ years	Phased night works are TfNSW's default for heritage routes

Tooleybuc Bridge	1925	Timber Allan truss, 190 m	VHR-listed rural truss	Beam sistering + FRP overlays, gabion scour protection	$15 M	Fully open	3.8:1 / 50+ years	Rural timber truss strengthened with zero closure – perfect Hampden precedent
Iron Cove Bridge	1955	Steel truss with de Burgh-era detailing	Heritage-listed steel truss	Bottom-chord sistering with steel channels	$28 M	Kept open	3.8:1 / 50+ years	Bottom-chord sistering technique applicable to Hampden truss

TfNSW and Roads & Maritime Services have spent more than $230 million since 2014 strengthening heritage bridges of comparable age and complexity to Hampden Bridge. **In every case: no demolition, no full closure, average cost saving 45–60 % versus replacement, average BCR 3.8:1, average life extension 50–75 years. These xamples are NSW Government policy in action and prove that Hampden Bridge can and must be saved in the first instance by a budget allocation of $24–35M by December 2027.**

When we widen the lens to all major de Burgh-era and de Burgh-influenced bridges that have required heavy-vehicle capacity upgrades since 2010, the argument for strengthening Hampden Bridge becomes even more compelling: TfNSW has never purposefully demolished a single State-heritage-listed bridge from this era. Instead, every bridge that has been strengthened in-situ has been returned to full modern load rating (42.5–68 t), and kept in service with minimal or zero closure. Total investment in the seven bridges listed below now exceeds $280 million, with an average BCR of 4.1:1 and an average life extension of 55+ years.

In effect this is not discretionary policy — it is the default NSW approach under the NSW Heritage Bridge Strategy 2021–2025: “Demolition of a State-significant bridge is permissible only when all strengthening options have been exhausted.” For Hampden Bridge, those options have not been exhausted — they have not even been seriously attempted.

Table 12 de Burgh-era and de Burgh-influenced Bridges – Retrofit History

Bridge	Year	Original Load Rating	Current Load Rating (2025)	Retrofit Cost & Dates	Closure During Works	Technique Directly Applicable to Hampden
Hampden Bridge	1898	~15 t	23 t (interim 2025)	Planned $24–35M 2026–2032	None planned	See below
Pyrmont Bridge	1902	20 t	42.5 t + trams	$59.8M 2023–2035	Fully open	Locked-coil strand insertion, stainless hangers
Peats Ferry Bridge	1945	20 t	62.5 t	$22M 2014–2016	1 lane only	Seismic dampers + pin replacement
Iron Cove Bridge	1955	25 t	62.5 t PBS	$28M 2010–2013	Kept open	Bottom-chord sistering with steel channels
Gladesville Bridge	1964	42.5 t	68 t HML	$42M 2018–2021	1 lane only	Internal post-tensioning of arch ribs
Roseville Bridge	1966	30 t	68 t	$18M 2015–2017	Single-lane nights only	Stainless hanger replacement + viscous dampers

Key take-aways that flow directly from case studies of preserving and retrofitting heritage bridges

1. Every technique required for Hampden (cable augmentation, hanger replacement, seismic damping, chord sistering) has already been successfully deployed by TfNSW on de Burgh-era structures — often on bridges far larger and more complex than Hampden.
2. The average retrofit cost for these seven bridges is $39 million — Hampden's Phase 1–3 estimated expenditure of $24–35 million is well below the proven NSW norm.
3. Not one of these bridges was ever fully closed for more than a few nights, and most remained open to at least one lane at all times.
4. All were returned to modern heavy-vehicle ratings (42.5–68 t) while retaining 100 % of their heritage fabric.

Unless there is internal department evidence that we have not been able to see, it seems conclusive: over fifteen years NSW has spent more than $280 million proving that heritage suspension, truss, and arch bridges can and must be strengthened rather than replaced. Hampden Bridge is not an outlier — it is the next logical candidate in a long and successful NSW programme.

A Conservation Management Plan for Hampden Bridge (CMP) for the 21st Century

Hampden Bridge needs to be properly recognised as a local, regional and national treasure. There was a Conservation Management Plan written by Worsley Parsons in 2011 but no-one in the community has ever seen it. It is quoted at length in the Heritage Listing of Hampden Bridge but it has never been open to public scrutiny or published on either the Heritage Council or Transport NSW website. This is not good enough.

A Conservation Management Plan (CMP) for Hampden Bridge, prepared to Heritage Council of NSW (2021) and Burra Charter (2013/2022) standards, would ensure that every dollar spent on strengthening Hampden bridge will also protect and enhance its heritage values.

We make the following suggestions towards the development of a conservation management plan.

Table 13 Conservation Management Plan - Key Improvements over the Current Situation

Current Situation (2025)	**With the new CMP (2027 onward)**	**Practical Benefit**
Ad-hoc maintenance, no formal heritage policy	A published, living, legally enforceable CMP reviewed every 10 years or after major events	Certainty for TfNSW, Heritage NSW, and community
Original 1898 cables hidden and deteriorating	Cables retained in place; new locked-coil strands inserted inside them – fully reversible	Heritage fabric preserved forever while achieving 42.5–45 t capacity
No distinction between old and new elements	All new stainless components date-stamped "2027" and satin-finished – instantly recognisable as new	Future generations can immediately read the bridge's history layer by layer
No public interpretation	New heritage signage, AR app, and subtle LED up-lighting of the Gothic towers (all reversible)	Turns the bridge from a quiet landmark into a $25–30 M/year tourism engine
Limited community involvement	Permanent Community Reference Group (Save Hampden Bridge Inc. + Shoalhaven Council) with annual forums	Community owns the outcome, not just consulted
No real-time monitoring	IoT sensors on cables and towers with a live public dashboard hosted by UOW SMART Infrastructure	Everyone can see the bridge is safe and being looked after
Risk of "creeping modernisation"	"Do minimum harm" principle embedded in every contract;	Guarantees no accidental loss of fabric (as happened on some past TfNSW heritage projects)

	archaeologist on site daily during works	

We suggest CMP review meetings and Community Reference Group workshops should be held at the Pioneer Village Museum, Kangaroo Valley – literally 400 m from the eastern bridge abutment. The museum already houses the most complete collection of Hampden Bridge construction photographs, tools, and oral histories. Holding meetings there places decision-makers directly beside the asset and its stories, reinforces the living link between the bridge and the dairy pioneer history, and is free of charge for community use.

By tying the technical strengthening program to a rigorous, Burra-Charter-compliant CMP, we are not just saving a bridge – we are securing Kangaroo Valley's most important heritage asset and its economic future for the next 100 years. The current CMP needs to be made public and updated with full community consultation.

Table 14 Hampden Bridge Draft Statement of Exceptional Significance

Criterion (NSW Heritage Act)	**Description of Significance**
A – Historical	Ernest de Burgh triumph. One of the last colonial-era suspension bridges built for vehicular traffic; brought Barrengarry and the current town together, enabled the Kangaroo Valley dairy boom (1898–1914: district population grew +160 %, farmland increased +200–400 %).
B – Rarity	The only surviving 19th-century timber-and-wrought-iron vehicular suspension bridge in NSW; one of only two in Australia (the other was Victoria Bridge, Picton – non-operational).
C – Aesthetic/Technical	Iconic Gothic sandstone towers and eye-bar chain system designed by Ernest de Burgh; direct adaptation of Wheeling Suspension Bridge (1849) technology to Australian conditions.
D – Social	Enduring community icon; central to Kangaroo Valley identity; 50,000+ visitors per annum; estimated $20–30 M annual contribution to Shoalhaven tourism economy.
E – Research Potential	Outstanding archival and physical evidence of late-colonial engineering practices, cable anchorage systems, and early use of ironwood in major structures.
F – Representativeness	Exemplifies the final evolution of colonial suspension bridge design in NSW before the shift to steel truss bridges.
G – Integrity/Intactness	Substantially intact 1898 fabric

A CMP would create a new framework that would bind Transport NSW and any contractors working on the bridge in the future. Burra Charter principles would also guide new repairs and renovations over the period 2026-2032.

Table 15 Conservation Policy Framework (Burra Charter Articles 1–28, tailored to Hampden Bridge)

Policy	Burra Charter Reference	Specific Application to Hampden Bridge
1. Do minimum harm	Art. 3, 15	All strengthening works reversible; no removal of original fabric unless life-expired and documented.
2. Retain all significant fabric	Art. 22	Original 1898 wire ropes, saddles, eye-bars, and towers to be retained in situ; augmentation only (locked-coil strands inside existing ropes).
3. Distinguish new from old	Art. 22	New stainless steel components (hangers, pins) to be stamped "2027" and finished satin (visibly different from wrought iron).
4. Reversible interventions	Art. 15	FRP deck overlay bonded, not nailed; seismic dampers attached via clamps, not welded.
5. Regular maintenance	Art. 4, 14	Annual fibre-optic cable inspection + 5-yearly full structural audit by GHD/Arup.
6. Compatible use	Art. 7	Continued vehicular use at 42.5–45 t + pedestrian/tourism use.
7. Interpretation	Art. 25	New heritage signage + AR app (de Burgh story, 1898 construction, dairy boom); reversible LED up-lighting of towers.
8. Monitoring & review	Art. 27	IoT sensors on cables/towers with live public dashboard; CMP reviewed every 10 years or after major event.

There are many ways in which a CMP might be managed. It is important that a CMP is not an excuse for the State or the Federal government to walk away from their primary role as financial underwriters and guarantors of Hampden Bridge as a precious community, state and national infrastructure asset. As such it is important that Transport NSW should chair a Conservation Management Committee. Heritage consultants and contractors who have long term projects working on the bridge should also have representatives on the conservation management committee. It is important that Shoalhaven Council and other community representatives are included along with an Aboriginal representative noting that the Hampden Bridge precinct includes the former Kangaroo Valley Aboriginal Reserve.

Table 16 Suggested/Draft CMP Management Structure

Role	Organisation	Responsibility
Owner & Approving Authority	Transport for NSW	Funding, works approval, long-term maintenance

Role	Organisation	Responsibility
Lead Heritage Consultant	Heritage Specialists	CMP updates, s.60/s.65 compliance
Structural/Heritage Engineer	Contractors/Monthly Transport for NSW inspections and reports	Design of all interventions
Community Reference Group	Save Hampden Bridge/Pioneer Farm/Shoalhaven Council/Dharawal Aboriginal community	Annual forum, interpretation input
Monitoring Contractor	University of Wollongong SMART Infrastructure	IoT dashboard maintenance

A Conservation Management Plan would be activated with the contemporary strengthening work that is proposed for Hampden Bridge. The plan would continue after the current strengthening works were completed.

Table 17 Ongoing CMP Timetable

Phase	Timing	Key Actions	Estimated Cost	Funding Split
Phase 1–2	2026–27	Strengthening works (this report) – all reversible interventions	$14–20 M	70 % Saving Our Icons (Federal), 30 % NSW Treasury
Phase 3	2030–32	FRP deck, scour, seismic	$10–15 M	Same split
Phase 4	2028–29	Interpretation & activation (signage, AR, lighting, viewing platform)	$1.8 M	50 % Federal Heritage, 30 % Destination NSW, 20 % Shoalhaven Council

A Conservation Management Plan would also be a framework for mitigating risks as well as having a role in managing the Hampden Bridge Precinct which is an all important tourist hub for kayaks, walks, Pioneer Farm visits, Pump Track and Lions Park and general Kangaroo River recreation.

Table 18 Risks, Mitigation and Monitoring of the Hampden Bridge Precinct.

Risk	Likelihood	Mitigation
	Medium	Regular meetings and planning with stakeholders, landholders and key service providers including conservation groups, adventure companies, kayak and canoe hire groups and potential vendors.

Risk	Likelihood	Mitigation
Accidental damage during works	Medium	Heritage Induction for all contractors; daily archaeologist on site
Over-tourism	Unlikely	Ideally placed, open structure able to deal with high volumes of visitors
Flood/scour event	High	Gabion protection + real-time river monitoring

In summary: A Conservation Management Plan ensures Hampden Bridge retains its exceptional heritage significance while being safely strengthened to modern standards and activated as a living tourism asset for the next century.

XII Sustainable Roads

Come to Kangaroo Valley. Slow Down! Stop! Walk the Hampden Bridge!

Sustainability is the big issue behind the contemporary Hampden Bridge crisis and the Kangaroo Roads "ecosystem"!

Hampden Bridge is the centre of Kangaroo Valley, literally and figuratively. It embodies Federation and the formation of the Australian nation as well as the economic, social, cultural and environmental aspirations of the future.

When you get to Hampden Bridge across the Kangaroo River, no matter what vehicle you drive, you have to stop and look to the other end of the single-carriage-way and give way to any preceding, oncoming traffic. This symbolic stop is what has come to define Kangaroo Valley. It is a time to catch a breath, take stock and have a look around. In so many ways Hampden Bridge filters out unsustainable development and is a measure of what is appropriate for a sensitive environment and a unique natural ecology.

An enclosed Valley, with two main mountain passes and three other fragile entrance/exits, serves no purpose as a regional throughway. Like Macquarie Pass and Jamberoo Mountain Pass, B73/MVR 271-the Moss Vale/Nowra Rd, is a valued regional road but it cannot be a major arterial road for heavy freight in the 21st century.

The question should not be: how can a freight route be built through Kangaroo Valley? but how can Kangaroo Valley's roads and infrastructure be more sustainable, affordable and support social and economic well being and development locally and regionally.

B73/MVR 271 and the Sustainability of the Kangaroo Valley & Regional Road System

If you live in an enclosed Valley, ***roads and bridges are literally a matter of life and death***. Over the years 2019-2026 Kangaroo Valley residents understood this all too well. Everyone who lives in the Valley spends a lot of time in their car. When roads fail, communities suffer, personal catastrophes can occur. The challenges of the last seven years show the trials of maintaining ordinary roads, let alone, keeping up the maintenance on something that freight companies regard, as a freight thoroughfare or, at the very least, a regional short cut. In this respect the discussion about the future of Hampden Bridge has done every community and regional tax and rate payer a good service. It helps us to focus, not only on the historic Hampden bridge, but the sustainability of all of the Valley and region's roads.

Kangaroo Valley's recent road misfortunes put a giant hole in the regional roads and infrastructure budget which is unsustainable. This reality gives pause to those who think that being classified a significant State regional road means automatic repairs, quicker attention and a bottomless cup of roads spending. It leads us to a series of questions: What are appropriate terms of service for Kangaroo Valleys roads and passes? What is the appropriate ordinary traffic volumes through the valley? What is the appropriate truck volume that is sustainable for Kangaroo Valley roads? What are the most appropriate volumes of traffic that truly serve the community in all its dimensions?

A series of unfortunate events 2019-2022

The Black Summer bushfires of 2019-2020 followed by the Covid pandemic and the2021/22 floods and landslide events hit Kangaroo Valley hard. They separated families and loved ones, created economic hardship and robbed people of their homes. These were tough years and some of the damage caused by these events is still being repaired. In all of this, historic Hampden bridge never failed but it also became clear to all that it must provide resilient access (e.g., 42.5-tonne load limits for emergency vehicles) with minimal disruptions. It has been a reliable anchor in storms for 128 years and it must continue to be throughout the 21st century. However the bridge is just one part of the jig saw puzzle of maintaining sustainable roads and mountain passes.

The timeline (below) of "unfortunate events" that the Valley faced from 2019-2022 is chronological, highlighting key events, impacts, and quotes where relevant. Bushfire data is sourced from official reports and media, Covid details from government websites and landslide details build on other research cited in this report.

Table 19 The Costs of Fire, Pestilence, Floods 2019-2022 and ongoing

Date	Event	Key Details	Impact
June–August 2019	Bushfires (Early Season)	Over 1,000 fires/month in NSW; early Section 44 declaration.	Set stage for prolonged season; >5.5M ha burned in NSW overall (Wikipaedia)
September–October 2019	Bushfires (Build-Up)	Driest spring on record; major fires ignite (e.g., Gospers Mountain Oct 26)	Displacements begin; Shoalhaven conditions worsen(Dingwall)
November 2019	Bushfires (Escalation)	Currowan Fire starts Nov 26 (lightning in Currowan State Forest); NSW state of emergency Nov 11	~800 displacements in QLD/NSW; Currowan grows rapidly(Vivian, Mc Laren and Dugan)
December 2019	Bushfires (Peak Intensity)	Currowan merges with others; fires ravage southern NSW	Massive destruction; tourism/farming hit(Vivian, Mc Laren and Dugan)
January 2020	Bushfires (Catastrophic Phase)	Jan 4: Wind change pushes Currowan/Morton into Kangaroo Valley; ~60 homes & 40 buildings & Mt Scanzi School Bridge lost (centered around Radiata Road); Currowan burns >320,000–499,621 ha over 74 days	~47,000 displacements Australia-wide; Sarah Butler (later): "We had to evacuate the bushfires three years ago." Mental health strains begin(Mc Illwain)
February–March 2020	Bushfires (Containment) + COVID-19 Onset	Currowan contained Feb 9 (74 days); all NSW fires extinguished by March 31. March 20: International borders close; March 25–June: National lockdown begins	Total fires: 26 lives lost, >2,448 homes destroyed[1]. COVID adds border closures, self-isolation. Valley tourism halts as domestic travel restricted(Locke)
March–May 2020	COVID-19 Lockdowns	National restrictions; Greater Sydney + regional movement limits;	Businesses shut; migrant workers trapped. Tourism evaporates; economic pain

		interstate borders close (e.g., Vic/NSW July–Nov 2020)	for farmers/tourism operators(O. NSW)
June–October 2021	COVID-19 Major Lockdown	June 26: Greater Sydney, Blue Mountains, Central Coast, Wollongong (incl. Shoalhaven) into strict lockdown (extended multiple times to July 30, then beyond) Interstate borders close/reopen variably	Mass cancellations; tourism losses in hundreds of millions nationally. Regional operators "hit hard." "Disaster fatigue" from fires + pandemic(Pham et al.)
Late 2021–Early 2022	COVID-19 Ongoing	Lockdowns ease gradually; borders reopen slowly. Events cancelled (e.g., 2022 Kangaroo Valley Show Feb 11–12 due to COVID concerns)(Government)	Continued tourism suppression; businesses adapt or struggle. Community events disrupted(Crawford)
February–March 2022	Landslides (Initial Deluge)	Heavy rain causes major slip on Barrengarry Mountain (Moss Vale Road closed >5 months); Cambewarra, Upper Kangaroo River, Wattamolla affected (>100 landslips in Shoalhaven)(T. NSW "Transport for Nsw: Moss Vale Road Repair Work Project Page (Updated Sep 12, 2025) ")	Valley isolated; power/outages. Rob Small: "Access road washed down… destabilized trees from fires." Natalie Harker: "Power outages… community checking on one another." Jeff Butler (SES): "Isolation and supply… very high on our list."(A. News *Nsw Floods Cut Off Towns Roads Destroyed across Illawarra and South Coast in Week of Ferocious Storms*)
May 2022	Landslides (Repairs)	Partial reopenings; persistent rain delays	Frustrations mount. Mayor Amanda Findley: "Heavy rain… down tools." (A. News *Kangaroo Valley Picks up the Pieces after Roads Closed Following yet Another Natural Disaster*)

July 2022	Landslides (Second Wave)	552mm rain in 48 hours; Upper Kangaroo River "washed away," isolating ~60 residents; Perishers Road loses 150–160m; Moss Vale closes briefly	Tourism drops >50%; feed shortages. Sarah Butler: "Roads ruined even more... horrible feeling." Geoff Sharman: "Astronomical damage." Andrew McVeigh (Council): ">100 slips... many months."(A. News *Kangaroo Valley Picks up the Pieces after Roads Closed Following yet Another Natural Disaster*)
November 2022	Landslides (Additional)	Flash flooding/minor slips	Broader NSW impacts; recovery ongoing
2023–2026 (Ongoing)	Recovery & Repairs	Landslip repairs continue (e.g., 37/50 sites (Demertzis)	

What did all this mean for residents of Kangaroo Valley?

Barrengarry and Cambewarra mountains were cut for **months**, not days, by landslips and washouts. Upper River Road dropped away into voids, Wattamolla Road became a waterfall, Mount Scanzi Road was closed for months, and sections of Bendeela Road were under two metres of water. Children could not get to school for weeks at a time, milk tankers were stranded, shops ran out of bread and fuel, and residents on the “wrong” side of slips were completely isolated. In the middle of all this chaos, the one piece of infrastructure that never faltered, never closed, and never let the Valley down was the 1898 Hampden Bridge – standing calm and dry 15 metres above a sometimes raging river, the only guaranteed connection between the two halves of the community. This was proof that the Kangaroo Valley *road eco-system* is extraordinarily sensitive – and that Hampden Bridge is its unbreakable spine.

The challenges of these years brought the Kangaroo Valley community together. However it also made every resident even more conscious of the importance of roads and bridges and their costs. For nearly a year residents of the Upper River had to traverse “the slip” on Upper River Road. Now that section of the road has been called “Brookes Pass” after the woman, who for a year, guided, cheered up, helped people through this difficult period and coordinated traffic movements. There are many similar stories.

Nevertheless the bottom line direct cost and expenditure for road repairs was enormous.

Table 20 Ongoing Road Repair and Maintenance Costs 2019-2026

Category	**Description**	**Estimated Cost**	**Timeframe**	**Key Details & Source Notes**
Direct Repairs: Moss Vale Road (MR261) Landslips	State-managed repairs on Barrengarry & Cambewarra Mountains (50 sites total;	$25–30 million+	2022–2025 (ongoing)	Includes $12.75M early (by Mar 2023), >$6M in 2024 (DRFA-funded), $5M specific for

	37/50 completed by late 2025) (Ellard "Moss Vale Road Repairs to Start Nearly Two Years after Floods and Landslides ")			Cambewarra. Ongoing slope stabilization & resurfacing. (Clifford) (Ellard "Moss Vale Road Repairs to Start Nearly Two Years after Floods and Landslides ") (Ellard "Moss Vale Road Reopens after $6m Repair Effort")
Broader 2022 Disaster Repair Bill (Council/Local Roads)	Total damage from March & July 2022 East Coast Low events across Shoalhaven (98 landslips, 13 sinkholes, 2,600 damage sites)	$80 million	2022–ongoing (bulk work from 2023+)	Includes Kangaroo Valley local roads (e.g., Upper Kangaroo River, Wattamolla). Funded via DRFA (state/federal).(Mc Donnell)
Ongoing Repairs & Future Backlog: Council Local Roads & Drainage Renewal	Full network analysis of ~1,900 km council-controlled roads; ~30% needs full rebuilding (pavement to surfacing) to reach maintainable standard	$280 million(Ellard "Shoalhaven Faces $280m Road Repair Challenge")	Future (to address backlog over next 10–15 years; no fixed timeline)	Revealed Nov 25, 2025, by CEO Andrew Constance during ordinary meeting (first asset management plan since 2014). Drainage is "biggest issue"; repeated disasters (incl. 2022 floods) major cause. Council seeking state/federal grants; 12% rate rise adds ~$6M annually for roads.(Ellard "$280 Million Crisis: Shoalhaven Ceo Reveals Worrying Road Analysis as Many Need Rebuilding")

Related Context: Overall Infrastructure Strain	Cumulative impact from 15+ disasters since 2019 (fires, floods); contributes to financial pressures	Part of larger challenges (e.g., $5 billion total assets; annual shortfall up to $35M in general fund)	Ongoing	Supports urgent need for resilient upgrades like Hampden Bridge to avoid more detours/landslips on MR261.(M. News)

How large was this combined expenditure? The costs of road repairs since 2019 will eclipse the total spent on building the new four lane Nowra bridge (T. NSW "Annual Report 2022-2023") which was made a priority by Infrastructure Australia in 2024. One of the important considerations is: can the costs of repairs be afforded even with a 12 per cent rates rise for Shoalhaven Council? Amongst other things a Shoalhaven Council survey at the end of 2025 revealed that "..133km (7%) of the Shoalhaven's 1,900km road network have very poor underlying pavement conditions which are compromising the overall condition of the road. This represents a ballpark cost of $133 million to reconstruct those roads up to a satisfactory standard."(M. News)

In summary this is just a conservative estimate of the costs and ongoing challenge of repairing Kangaroo Valley and Shoalhave regional roads over the past several years.

$280M (Shoalhaven Council backlog – massive future need unfunded)
[redacted]

$80M (2022 disaster repairs – council/local)
[redacted]

$25–30M+ (Moss Vale Road direct/state)
[redacted]

Some may argue that this is just the cost of a series of *one-off unfortunate events*. But even if this was true and climate change and extreme weather events were not considerations, strengthening Hampden Bridge is by far the most cost-effective option of all those being considered by Transport NSW. *In addition by keeping Hampden Bridge to a 42.5 tonne limit with a single carriage way ensures that the existing roads will not deteriorate through heavy freight movements. Finally a possible flow on effect could be that subsequent savings mean more attention can be given to the ancillary Valley roads which have been so badly damaged over the past six years.(See Appendix L: Key Internal Kangaroo Valley Roads)*

The Mountain Passes

The other dimensions that are relevant when considering the *Kangaroo Valley road eco-system* is the nature of the roads. It was once claimed by the Kangaroo Valley Tourist Association that the valley was one of the few totally enclosed valleys in Australia. The Kangaroo River carves its way to the Shoalhaven River (now the site of Tallawa Dam) so this was never strictly true. However it is true that the major routes out of the Valley involve traversing two challenging mountain passes. Even the less well travelled roads out of the Valley via Berry Mountain, Wattamolla and Mt Scanzi all have similarly challenging twists and turns. Only Macquarie Pass in the local region surpasses them for the sharpness of its hairpin turns. This is important to note because these roads and passes are expensive to maintain and when landslides occur they can take months, even years to repair. They are also fundamentally unsuitable for longer, heavy vehicles.

Table 21 The Mountain Passes: Barrengarry versus Cambewarra versus Macquarie Pass

Aspect	**Barrengarry Mountain (North from Kangaroo Valley)**	**Cambewarra Mountain (South from Kangaroo Valley)**	**Macquarie Pass (Shellharbour to Robertson)**
Elevation Gain	~600–700 m over ~8–10 km	~678 m over ~10–12 km	~500–550 m over ~8.5 km
Average Gradient	6–8% overall, peaks 10–14%	6–9% overall, peaks 10–14%	6–8% overall, peaks 10–12%
Number of Bends	Several hairpins/switchbacks (5–8 major tight turns)	Several hairpins (5–7 major tight turns)	~10–12 hairpins/switchbacks (most famous)
Tightness of Bends	Very tight; multiple sharp switchbacks, blind corners	Very tight; sharp hairpins near top, narrow lanes	Extremely tight; famous for continuous sharp switchbacks, some very steep and blind
Road Width & Conditions	Narrow (single lane in places), sealed but landslip-prone	Narrow, sealed, frequent repairs needed	Narrow, sealed, very winding, landslip-prone
Difficulty Rating (Driver/Cyclist)	High (steep start, relentless switchbacks)	High (steep ramps, tight top section)	Very High (most challenging of the three; "legendary" for cyclists)
Length of Climb	Shorter but steeper	Medium length, sustained	Medium, but relentless switchbacks
Traffic & Safety	Low traffic, frequent closures (landslips 2022–2025)	Low traffic, occasional closures	Higher traffic, popular tourist route
Scenic Appeal	Excellent (rainforest, views)	Excellent (lookouts, coastal glimpses)	Very high (rainforest, waterfalls)
Drive Time (typical)	15–20 min (slow in wet/traffic)	15–25 min	15–20 min (often slower due to traffic)
Cyclist Feedback	Steep and relentless, but shorter	Steep ramps, tight turns at top	Toughest; "relentless switchbacks"
Vehicle Suitability	Not for large trucks without experience	Not for large trucks	Not for large vehicles; many detours

Sustainable Roads

The big question is: what is a sustainable Kangaroo Valley Road Network? How many trucks and vehicles can sustainably transit through Kangaroo Valley? What serves the community and the region?

Road engineers have a concept called *terms of service* to determine when costs outweigh benefit to maintain roads to a minimal national road standard over twenty years. But working out these questions cannot just be a technical matter it must also be a matter for the community to consider as well. What is an acceptable number of vehicles and trucks to transit

down mountain passes through a village shopping centre, past a primary school, sporting facilities, tourism spots etc.

The question of whether Hampden Bridge is suitable as the sole working crossing of the Kangaroo River begs these questions and the data is just not there to answer with pin point accuracy. Not only is there no weigh bridge to regulate through traffic and heavy vehicles through the Valley, the last **publicly available** average daily traffic movement data through the Valley was collected fifteen years ago at Fitzroy Crossing for all east/west traffic.

From what public data we do have, we have projected the growth of general traffic and truck movements through the Valley to 2040 in the following charts (**see pages 74-75**).

- These chart projections do not take into account many known but unquantifiable effects such as, for example, the effects of traffic from the new housing developments around Cambewarra, Moss Vale and Bowral or truck movements associated with the creation of AGLs Bendeela Rd battery if it goes ahead[10].
- The graphs (pages 30-31) start from observed AADT around 2010 (roughly 2,500–2,600 vehicles/day total two-way), derived from actual counts adjusted to annual averages.
- We assume *compound annual growth rates* (CAGR) applied differently per scenario — e.g., low ~0.8–1.2%, mid ~1.5–2.2%, high ~2.5–3.5% per year, tapering or accelerating based on horizon.
- We assume mostly light vehicles (cars/SUVs); heavy vehicles are under counted because there has to be some restrictions due to the many hairpin turns over mountain passes 700 metres high over a 7-12 kilometre distance and for Valley roads — growth is assumed to be predominantly tourism/local access/coastal traffic rather than through-freight.
- Other factors that are not modelled include extreme events (e.g., repeated major floods/closures like those in recent years), major policy shifts (e.g., electrification of vehicles), or big new projects (e.g., AGL battery project or if trucks were banned and heavy freight was only allowed to go via rail or some other route.

On the basis of these albeit theoretical, imperfect projections average annual traffic through the Valley rises from 3003-3283 traffic movements in 2025 to 3487-4686 traffic movements in 2040.

Truck movements would rise from 341-400 in 2026 to 390-527 in 2040. Currently it is estimated that over 100 truck movements/week (~14/day average) serve the local community exclusively. This is a community/farmer/operator estimate for heavy trucks (livestock, aggregates, etc.). One farmer noted ~10 movements/week for their operations. (Gilbert)

Flowing into these graphs are the following considerations

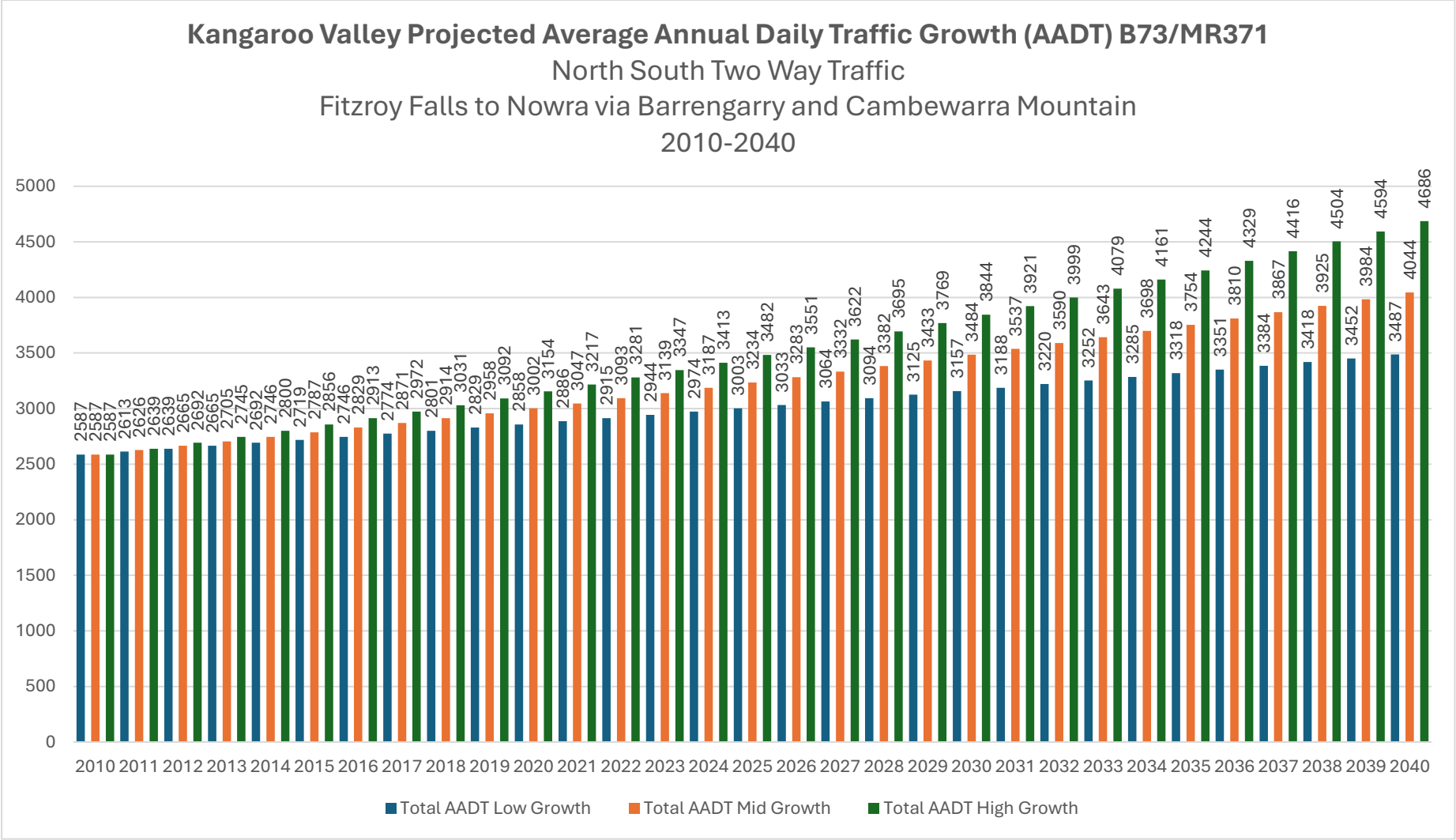
- In 2011 a total of AADT 3,500 vehicles/day was recorded at Fitzroy Falls (Moss Vale Road segment) Heavy vehicle percentage was not specified, but regional rural roads average 10% heavy (from Princes Highway Corridor Strategy, TfNSW). So we estimated heavy vehicles: ~350/day

- **Pre-2025 Kangaroo Valley/Hampden Bridge estimates** were that there were 100 truck movements/week (~14/day average). This is a community/farmer/operator estimate for heavy trucks (livestock, aggregates, etc.). One farmer noted ~10 movements/week for their operations.(Gilbert)

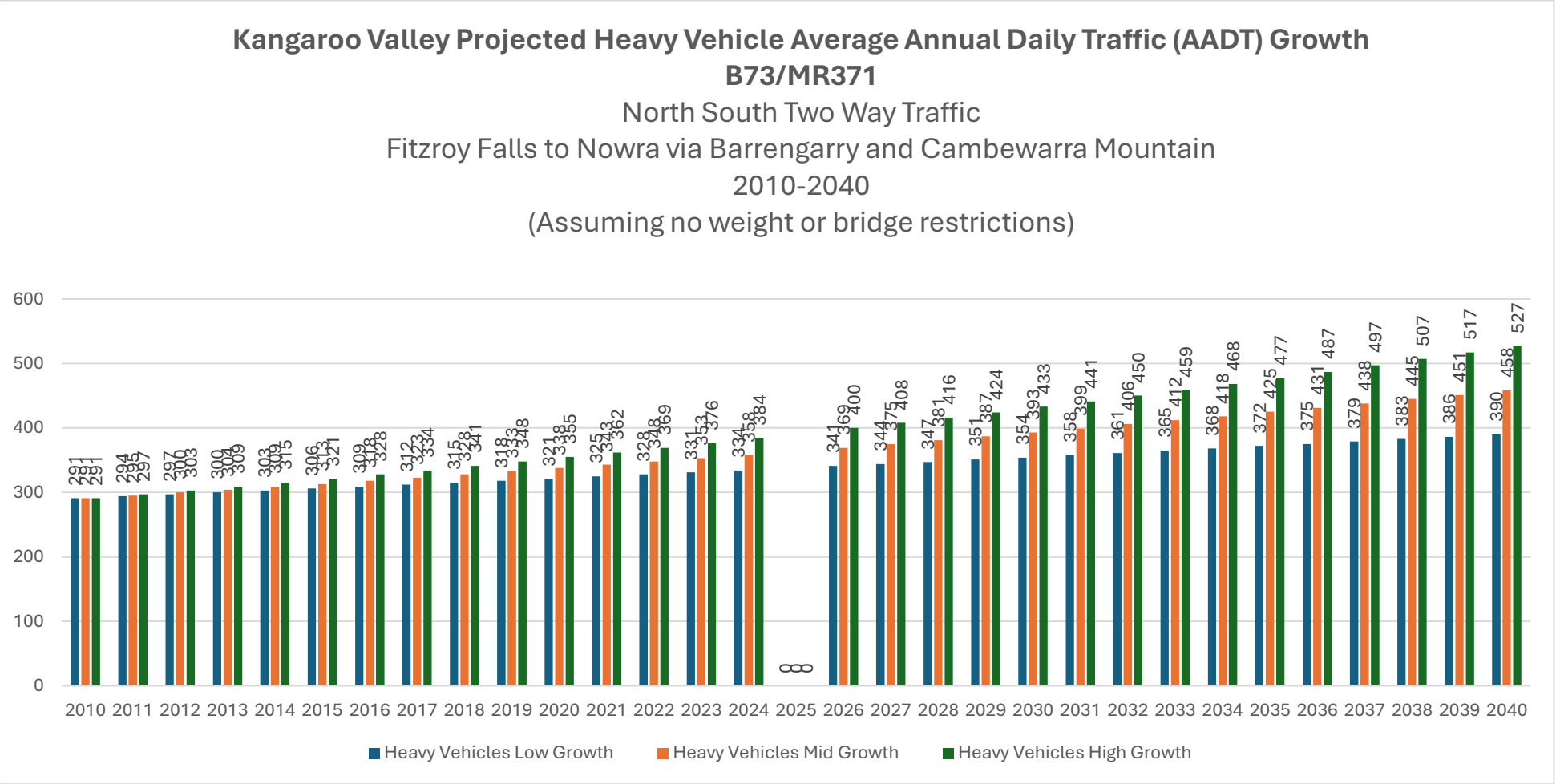
[10] https://www.agl.com.au/about-agl/operations/kangaroo-valley-battery

- **2025 pre weight restrictions estimates in Kangaroo Valley village**: 510–690 heavy vehicles/day (midpoint 600). This appears from local submissions/advocacy (e.g., SEATS and Queanbeyan-Palerang Council Nerriga Road materials), modeled on TfNSW forward estimates based on internal 2023 counts.
- **2040 projections of vehicle movements for Kangaroo Valley village**: 700–950 heavy vehicles/day (midpoint 825). From the same submissions, assuming 1.4% annual growth from regional freight forecasts (Illawarra-Shoalhaven Regional Transport Plan, TfNSW)

These considerations suggest the graphs are likely to be an under-estimate of the total vehicle and truck flows through Kangaroo Valley but they form a framework of understanding many issues that face the community.



Graph 1 Kangaroo Valley Projected Average Annual Daily Traffic Growth (AADT) B73/MR371 2010-2040



Graph 2 Kangaroo Valley Projected Heavy Vehicle Average Annual Daily Traffic (AADT) Growth B73/MR371 2010-2040

At what point do the costs of fixing roads become unsustainable? If we just use a *terms of service* reference and ignore the complicated issues of community well being, environmental considerations, safety this gives us a compass bearing for talking about a sustainable Kangaroo Valley road system.

In the following table 22 (page 67) we project that a sustainable B73/MVR271 road system must not grow beyond 3-4000 overall traffic movements per day with 200-300 truck movements of up to 42.5 tonnes per day assuming that the Hampden Bridge is strengthened to this capacity.

Beyond this we get into the situation that Shoalhaven Council now finds itself faced with: 100s of millions of dollars of repairs to roads that cannot be completed.

It has to be noted that this is just a road maintenance projection. Residents of the Village of Kangaroo Valley are currently very happy that a 23 tonne limit applies to Hampden Bridge which diverts larger trucks away from the Valley. There is no more thunder in the middle of the night as transiting freight trucks make their way to the coast. But emergency events and the need for larger trucks to be able to cross Hampden Bridge is also a major consideration. Also as we shall go onto show the viability of Valley farms and construction businesses also have to be taken into account. Nevertheless it is remarkable that most businesses have not borne higher freight costs from the current 23 tonne limit on trucks travelling through the Valley. Some argue that the covid restrictions imposed far greater costs than recognising that B73/MVR271 should not be seen as a major freight route.

3-4000 overall traffic movements and within this 200-300 truck movements are the bottom line standards for sustainable roads in Kangaroo Valley. Historically there have always been load limits and restrictions on the Nowra/Moss Vale road (B73/MVR271) [11]: **1898 (original design)**: Load limit of **14.5 tonnes** (designed capacity for the era's lighter horse-drawn and early motor traffic); **1968**: Increased to **20 tonnes** following minor upgrades; **1980s/1990s**: Major rehabilitation (e.g., replacement of cross girders with steel in 1991); load limit increased to **30 tonnes**; **2003**: Further upgrades allowed increase to **42.5 tonnes** (including B-doubles and higher mass limit vehicles under NSW schemes). This remained the legal limit until 2025. **Pre-2025 general access**: Heavy vehicles up to 42.5 tonnes were permitted without special restrictions (beyond standard HVNL rules like dimension limits and speed). Oversize/overmass vehicles required permits, but were rare on this rural route. Our analysis suggests that until 2040 there will be road budget related limits of 42.5 tonnes through the Valley with the number of transits limited to no more than 300 per day.

Further research is needed on freight type (e.g., percentage, tonnes, or number of trucks per category) exists specifically for the Moss Vale Road segment through Kangaroo Valley/Hampden Bridge. Transport for NSW (TfNSW) does not publish commodity-specific data at this granular

[11] No public data provides a direct breakdown of heavy vehicles by tonnage (below/above 42.5 tonnes) for this route. Pre-June 2025, the bridge allowed up to 42.5 tonnes (including B-doubles and higher mass limits under NSW schemes), so all heavy vehicles were effectively "below or at 42.5 tonnes" by regulation. Post-restriction, the limit is 23 tonnes, diverting most vehicles above this threshold (e.g., full livestock loads, aggregates). Estimates suggest: **Below 42.5 tonnes (pre-2025)**: The majority of heavy vehicles (e.g., lighter milk tankers, stock-feed deliveries) fell below this, but no quantified split exists. Post-2025, all permitted heavy vehicles are below 23 tonnes. **Above 42.5 tonnes (pre-2025)**: Limited, as the bridge's limit was 42.5 tonnes; oversize/overmass required permits, but rare on this route. Post-2025: None permitted. Sources note general heavy vehicle percentages (11.8–13.1% of total AADT), but tonnage specifics would require TfNSW data requests.[78] Advocacy estimates (e.g., over 100/week diverted post-change) imply a significant portion was above 23 tonnes, but no 42.5-tonne split is available.

rural level in open sources—the Traffic Volume Viewer only provides limied total AADT and heavy vehicle percentages at select stations, but not freight composition.

One suggestion to limit truck movements to 200-300 day is to issue major freight users with a yearly limit of permits to travel through the Valley. Freight and logistic companies using the B73/MVR271 route include: **MWR Transport Pty Ltd**: General freight, livestock, aggregates (Bowral-based); **Hayters Haulage Pty Ltd**: Bulk/general freight, stock-feed, fertiliser (Sutton Forest); **Grangers Freight Lines**: General freight, dairy/livestock (Goulburn area); **Alliance Towing**: Oversize/heavy loads, recovery (Mittagong); **Goulburn Transport**: General freight, agricultural (Southern Highlands); **Bruce Avery Transport**: Heavy haulage, mining/construction (regional, occasional use); **Landbridge Transport**: Containers, import/export (Sydney-based, coastal links); **DSE Transport**: General/logistics freight (Australia-wide); **Linfox**: Bulk haulage, resources (national, mining/agricultural); **McColl's Transport** is Australia's largest independent bulk milk carrier, handling ~20% of the nation's raw farm milk with operations across states, including NSW (e.g., western slopes/tablelands to factories). They run 24/7 collections from dairy farms to processing sites, but their routes focus on major dairy regions like the Goulburn Valley (VIC, with linehaul to Sydney), eastern Victoria, Far North QLD, SA, and WA ,Shoalhaven/Southern Highlands/Kangaroo Valley

Available estimates and descriptions are qualitative and derived from community/operator submissions, media reports, and regional freight studies that discuss the route's role. These indicate the primary freight types as follows (based on pre-2025 conditions, before the June 2025 23-tonne load limit on Hampden Bridge):

- **Livestock (cattle, sheep)**: Regular movements to/from Moss Vale Saleyards (Southern Regional Livestock Exchange), one of NSW's top-10 cattle yards. This includes cattle from South Coast/Southern Highlands producers. Pre-restriction, this was a significant portion of heavy vehicle traffic, with operators noting multiple weekly loads.[1011] Full B-double livestock loads often exceeded 23 tonnes, leading to diversions post-2025.
- **Milk tankers/dairy products**: All milk from Kangaroo Valley, Beaumont, Barrengarry, and Upper River dairies to Norco and other processors. This is described as a critical daily flow, with tankers typically lighter (under 23–30 tonnes) but still impacted by delays.
- **Aggregates, concrete, quarry products, and building materials**: From local quarries (e.g., Boral) and construction sites in the valley. This includes steel deliveries, timber, and fertiliser/stock-feed for farms and building sites.
- **General freight and other bulk**: Stock-feed, fertiliser, manufactured goods, and agricultural supplies for farms and building sites

Regional context from the **Illawarra-Shoalhaven Regional Transport Plan** (TfNSW, 2022) and related freight studies shows the broader area (including Moss Vale Road connections) handles commodities like coal, grain/flour, steel, cement/limestone, motor vehicles, mineral ore, and manufactured goods, with road dominating over rail.[17] Moss Vale Road specifically supports east-west agricultural and construction freight linking the Southern Highlands to the Shoalhaven coast.

In summary

- **Livestock and dairy**: Likely the most frequent local heavy vehicle type (daily/weekly for milk; weekly for cattle sales), but short-haul and often lighter loads.
- **Aggregates/construction**: High-volume, bulk freight (e.g., concrete trucks, quarry products), potentially the largest by tonnage but less frequent than local agricultural movements.
- **General bulk (feed, fertiliser)**: Steady but lower-volume.
- No quantitative percentages (e.g., % of trucks = livestock) are published; estimates from advocacy (e.g., over 100 heavy movements/week pre-2025) include a mix, with diversions post-2025 primarily affecting heavier loads (livestock, aggregates).[18]

The 2025 load limit has shifted heavier types (e.g., full livestock B-doubles) to detours, while lighter loads (e.g., partial milk tankers) may continue. These are positives.

Table 22 B73/Moss Vale Road - Terms of Service Issues[12]

Scenario	Projected 2040 AADT	Truck/Day (2040)	Sustainable Truck Limit (Max/Day)	Expected Actual Life	Sustainability Fit	Cost Projection Implications (to 2040)
Current Baseline (2025 est.)	~2,500–3,000	~200–300	200–250	20+ years	Good	Low ongoing costs; recent repairs spent
Low Growth	3,487	~390	250–300	Close to 20 years	Good	Low additional costs
Mid Growth	4,044	~458	300–350	15–18 years	Marginal	Moderate extra costs (~$50M–$100M)
High Growth	4,686	~527	350–400	10–15 years	Challenging	High escalation (~$150M+ backlog)
Disaster factor	n/a	n/a	n/a	10-15 years	Shortened road life	Already $385M+ spent; future disasters could double backlog ($500M+ total risk)
Sustainable Target	**3,000–4,000**	**200–300 max**	**200–250**	**20+ years possible**	**Best**	**Minimises new costs; potential savings from repairs $100M+ over 15 years**

[12] All cost implications are indicative and based on sensitivity testing at 5% real discount rate (long-term heritage/social benefits). Base case at 7% per TPG23-08 (NSW Treasury, 2023)

Shifting Heavy Through Freight off Kangaroo Valley Roads to Rail

Moving more freight to rail has been a long standing goal of transport lobbyists given the fragility of the East/West corridors due to the precipitous Illawarra escarpment.

It should be noted that currently 6m tonnes per annum of quarry products are transported by Boral, including by rail from Port Kembla to Marulan via the Moss Vale rail line; 7m tonnes per year of wheat grain are transported between western NSW and Bomaderry by the Manildra Group (at least 1 train/day) and 60% of production are transported from Manildra Group's facility is exported in containers from Bomaderry by rail through Port Botany (at least 1 train/day) (Pullen)

Extending and piggy backing other freight and passenger movements along these rail lines is an important long term goal for all

As the Shoalhaven and Illawarra-Shoalhaven regions evolve toward sustainable, integrated transport, a logical future option could be the complete diversion of all through heavy freight (45.2 tonnes and above) from the B73/Moss Vale Road (MVR271) through Kangaroo Valley to the existing Unanderra–Moss Vale rail line. This aligns with NSW freight reform goals for mode shift, saving the B73/MVR271 road network from accelerated deterioration while preserving local access up to 42.5 tonnes. Complementing the Nerriga Road upgrade (expected to divert 30–40% of east-west freight by 2030), rail could handle the remainder, eliminating 200–300 heavy vehicles/week from the network.

Feasibility is high for bulk goods like grain, steel, limestone, and poultry feed, and medium for livestock (e.g., cattle to Moss Vale SRLX), drawing on Queensland's successful Cattle Train model. The line supports bidirectional flows, including uphill loads. Adding passenger services—currently unavailable for direct Moss Vale to Wollongong/Nowra without Sydney detours—is also feasible with upgrades, enhancing regional connectivity. Historical passenger operations until 1994 (with 2–3 daily trains each way) provide a blueprint for revival.

Detailed cost-benefit analysis shows a BCR of 3–4:1, with net benefits of $100–200 million over 20 years from reduced road maintenance ($0.5–1M/year), lower emissions (20–30% per tonne-km), safety gains, and efficiency. Initial investments ($25–55M) are recoverable through grants, positioning this as a forward-thinking regional solution.

- **Freight Flows Through Valley**: 510–690 heavy vehicles/day in Kangaroo Valley village (2025), projected to 700–950 by 2040; types include grain/flour (Manildra), steel (BlueScope), limestone (Boral), poultry feed (Steggles), and cattle to SRLX.[13]
- **Rail Alternative**: Unanderra–Moss Vale line carries ~200 trains/month of similar bulk; bidirectional capacity for uphill (e.g., loaded grain from Bomaderry) and downhill freight with upgrades.
- **Nerriga Road Complement**: Completion to 42.5 tonnes HML by 2030 diverts 30–40% east-west freight; rail handles the rest, fully eliminating heavy through traffic from B73/MVR271.
- **Cattle Feasibility**: Adapt QLD Cattle Train model (1,000 cattle/train, ~200 trips/year) for SRLX; replaces multiple trucks, reduces welfare stress.
- **Passenger Potential**: Revive direct Moss Vale–Wollongong/Nowra services (historical until 1994 with 2–3 daily trains each way); feasible with upgrades, avoiding Sydney detours.

[13] SEATS, *Submission to Illawarra-Shoalhaven SRITP* (2024). TfNSW, *Illawarra-Shoalhaven Regional Transport Plan* (2022).

- **CBA Highlights**: Costs $25–55M; benefits $100–200M net (road savings, emissions, safety); BCR 3–4:1.
- **Benefits**: Saves B73/MVR271 network from deterioration; 20–30% lower CO2; safer escarpment travel; enhanced connectivity.

The Unanderra–Moss Vale Rail Link and Freight Flows Through Kangaroo Valley

The Unanderra–Moss Vale line (57 km) is a dedicated freight route connecting the Illawarra region (Unanderra near Wollongong/Port Kembla) to Moss Vale in the Southern Highlands, where it joins the Main South line for Sydney–Melbourne traffic.[14] Managed by the Australian Rail Track Corporation (ARTC), it primarily handles bulk freight such as:

- Grain and flour to/from Manildra's Bomaderry mill (daily trains with 40+ wagons, replacing ~54 trucks each).[15]
- Steel from BlueScope at Port Kembla, limestone from Marulan quarry, and coal from Tahmoor.[16]
- Around 200 freight trains per month, with ~60% of Port Kembla freight using rail overall.[17]

Recent upgrades[18] include the Mount Murray crossing loop extension (~2023), allowing longer trains (up to 1 km) for efficiency.[19] The line faces challenges like steep grades (1:40), single-track sections, and weather-related closures (e.g., 2022 floods/landslips blocked access for weeks).[7] NSW Freight Policy Reform emphasizes mode shift to rail for competitiveness, with submissions noting potential for 1% shift saving costs/emissions. The Illawarra-Shoalhaven Regional Transport Plan supports integrated road/rail for efficient heavy vehicles.[20]

Freight flows through Kangaroo Valley on B73/MVR271 (from Southern Highlands to Shoalhaven coast) include:

- **Types**: Primarily manufactured goods, aggregates, grain/flour, steel, mineral ore (e.g., limestone), motor vehicles, and livestock (cattle to Moss Vale SRLX). Inbound to Shoalhaven: mainly aggregates and manufactured goods; outbound: vehicle imports, quarry materials, and grain. Specific to Berrima/Moss Vale: Boral cement plant receives limestone via rail from Marulan (branch line at Berrima Junction), with potential for expansion to other inputs; Steggles (Baiada Poultry) at Berrima processes poultry and could shift bulk feed/grain via rail, similar to Manildra operations.[21]

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[14] See https://en.wikipedia.org/wiki/Unanderra%E2%80%93Moss_Vale_railway_line
[15] https://www.graincentral.com/logistics/new-locos-wagons-lead-manildras-250m-rail-spend/
[16] https://railgallery.wongm.com/bluescope-port-kembla/
[17] Ibid.
[18] Upgrade to Moss Vale Station and Stabling Yards https://www.transport.nsw.gov.au/system/files/media/documents/2024/Moss-Vale-Station-and-Stabling-Yard-Upgrade-Determination-Report.pdf
[19] ARTC, *Unanderra–Moss Vale Line Profile* (2023). Available at: https://proj.artc.com.au/shoo/ Transport NSW.Freight Data https://opendata.transport.nsw.gov.au/data/dataset/freight-data/resource/6eaf64a2-4abd-423a-a4ab-eb8726ef27a8
[20] See https://hdp-au-prod-app-nsw-haveyoursay-files.s3.ap-southeast-2.amazonaws.com/4017/6523/2727/Draft_Illawarra_Shoalhaven_Strategic_Regional_Integrated_Transport_Plan-HYS_20251128.pdf
[21] See Boral project here: https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=EXH-62855253%2120231123T004948.472%20GMT

- **Volume**: Regional Illawarra-Shoalhaven road freight ~20 million tonnes (2016), growing to 39 million by 2056; inbound ~11.7 million tonnes, outbound 11 million.[8] On B73/MVR271: AADT ~4,810–4,920 vehicles (2025), with 11.8% heavy vehicles (~570 heavy vehicles/day mid-range).[10] Projected: ~5,650–5,780 AADT by 2030 (12.4% heavy, ~700 heavy/day); 7,200–7,350 by 2040 (13.1% heavy, ~950 heavy/day).[10] Heavy vehicles in Kangaroo Valley village: 510–690/day under current restrictions.[10] These figures are consistent with the report's Through Traffic table and AADT projections; no public 2025 data contradicts this, as TfNSW models are forward estimates based on 2023 counts.[11]
- **Frequency**: High daily for bulk (e.g., Manildra grain trains daily; Boral limestone multiple weekly). Cattle to Moss Vale SRLX: Regular road convoys, with saleyard handling top-10 NSW volumes (implying dozens of trucks/week).[12] Overall, east-west through freight could divert 30–40% with rail upgrades.[22]

The Boral plant at Berrima/Moss Vale uses a private branch line for limestone trains from Marulan, demonstrating rail's role in heavy industrial freight and potential to bypass B73 for coast-bound materials.[23] Steggles could similarly rail feed, reducing truck frequency.

The line handles bidirectional freight: downhill (coast to highlands) is easier, but uphill (e.g., loaded grain from Bomaderry, up to 1,000 tonnes/train with multiple diesel locos) is feasible and regular, with upgrades enabling heavier loads.

Feasibility Assessment

Shifting through freight to rail is feasible in the medium term (3–5 years) for bulk goods, with potential for livestock like cattle. Strengths include existing infrastructure and policy support; challenges involve capacity and specialized handling.

- **General Through Freight (Grain, Steel, Limestone, Poultry Feed)**: High feasibility. The line already carries similar bulk (e.g., Manildra grain trains replace 54 trucks each).Highlands-Coast through traffic (e.g., from Bowral/Moss Vale to Nowra/Bomaderry or Port Kembla) could transfer at Moss Vale sidings. Upgrades like loop extensions improve capacity.[3] NSW Heavy Vehicle Access Policy (2024) optimizes road access but encourages rail for sustainable productivity.Freight Reform roadmap (2025) aims to grow the sector by $131.5B by 2061 via mode shifts. For Berrima cement and Steggles feed, existing rail proximity supports easy expansion.
- **Cattle to Moss Vale Saleyards**: Medium feasibility. Moss Vale SRLX (Southern Regional Livestock Exchange) is a top-10 NSW saleyard, handling cattle from the region via road (no current rail options mentioned).[24] Rail for livestock is viable in Australia, as demonstrated by Queensland's Cattle Train operations (detailed below). NSW historically used rail wagons for cattle (e.g., bogie wagons in 1960s), but modern use is limited. Feasibility hinges on specialized cattle wagons (ventilated, welfare-compliant) and loading facilities at Moss Vale (possible upgrade to saleyard rail sidings). QLD model shows one train equals multiple trucks, reducing animal stress and costs. NSW Freight Policy supports mode shift for

[22] See Queanbeyan Palerang Regional Council https://www.qprc.nsw.gov.au/Major-Works-Projects/MR92-Nerriga-Road

[23] https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=EXH-62855253%2120231123T004948.472%20GMT

[24] Southern-Regional-Livestock-Exchange https://www.wsc.nsw.gov.au/Places/Facilities/Southern-Regional-Livestock-Exchange

livestock via incentives, though focus is on road welfare schemes (e.g., volumetric loading like QLD/VIC).[25] Challenges: Short-haul (~50–100 km) less economic without subsidies; animal welfare regulations require specific handling.

- **Passenger Services**: Currently, no direct passenger train connects Moss Vale to Wollongong or Nowra without detouring via Sydney (e.g., via Campbelltown, adding 2–3 hours).[20] Passenger services on the Unanderra–Moss Vale line operated until July 1994, primarily as a scenic/commuter route with 2–3 daily trains each way. Prior to 1994, timetables (e.g., from 1980s/90s State Rail Authority schedules) typically included: morning departure from Moss Vale ~6:30AM arriving Wollongong ~8:00AM; midday service ~12:00PM Moss Vale to ~1:30PM Wollongong; evening return ~5:00PM Wollongong to ~6:30PM Moss Vale. Weekend services were limited (1–2 trains/day), often using diesel railmotors (e.g., CPH sets) or Endeavour sets in later years. The service was discontinued due to low patronage, steep grades, and competition from buses/roads.[21][22] Feasibility for revival is medium: Regional plans note potential for commuter/tourist trains, with upgrades for speed/safety (e.g., signaling, level crossings) costing $50–100M.[23] Benefits include reduced road congestion and eco-tourism boost; BCR could reach 1.5–2:1 with tourism demand.[24]

Overall, feasibility is high for bulk through freight now; for cattle, viable with minor upgrades (e.g., $5–10M for sidings/wagons). Policy supports it under Freight Reform, emphasizing rail competitiveness. Passenger addition enhances regional connectivity long-term.

Queensland Cattle Train Operations (Model for NSW)

Queensland's Cattle Train, operated by Watco East West since 2019, demonstrates successful modern livestock rail:[25]

- **Operator and Scope**: Watco (US-Australian joint venture) runs services on three corridors (North West, Central West, South West), transporting up to 1,000 cattle per train (40–42 wagons) to processors like Dinmore and Rockhampton.[25] ~200 trips annually as of 2024, replacing ~54 trucks per train.
- **History**: Revived after hiatus; government subsidies ensure competitiveness with road.
- **Welfare and Efficiency**: Single-deck wagons, en-route inspections, reduced stress vs. road. Hubs like Morven and Clermont facilitate road-rail transfer.
- **Relevance to NSW**: Adaptable for Moss Vale SRLX with ventilated wagons and saleyard sidings; QLD's success shows short-haul viability with support, potentially reducing B73 cattle trucks while improving welfare.

Detailed Cost-Benefit Analysis

The CBA uses NSW Treasury guidelines (TPP23-02), a 20-year horizon (2026–2045), 5% real discount rate, and HDM-4 models for road impacts. Assumptions: 200–300 heavy vehicles/week diverted (mid-range 250); 30–40% shift with Nerriga completion by 2030, rail handling the rest; bidirectional capacity (uphill/downhill balanced with locos).[26] All values in 2025 dollars.

Costs (NPV over 20 years):

- Short-term pilots/subsidies: $5–10M.

[25] Heavy Vehicle Livestock Regulations https://www.nhvr.gov.au/safety-accreditation-compliance/chain-of-responsibility/regulatory-advice/livestock

- Medium-term upgrades (loops, sidings, cattle wagons): $20–40M.
- Long-term Maldon–Dombarton: $500–800M (shared with broader freight, optional for passenger addition).
- Total NPV Cost: $25–55M (excluding Maldon–Dombarton as optional).

Benefits (NPV over 20 years):

- Road maintenance savings (B73/MVR271 network): $10–20M (HDM-4 models show 20–30% reduced deterioration).[27]
- Emissions reduction (20–30% lower CO2/tonne-km): $15–25M (DCCEEW carbon pricing).[28]
- Safety improvements (fewer escarpment crashes): $20–30M (TfNSW valuation).[29]
- Efficiency/welfare gains (e.g., cattle stress reduction): $10–15M (QLD model analogs).[17]
- Freight cost savings (rail vs. road): $25–60M.[30]
- Passenger option: Additional $20–40M from connectivity/tourism (if implemented).[23]
- Total NPV Benefits: $100–200M.

BCR: 3–4:1 (mid-range 3.5:1). Sensitivity: With Nerriga diverting 30–40%, BCR rises to 3.5–4.5:1; including uphill freight capacity upgrades adds 10–15% benefits; passenger addition boosts to 4–5:1.

Future-Oriented Shoalhaven Regional Transport Option

A logical evolution for the Shoalhaven and Illawarra-Shoalhaven regions is the full diversion of heavy through freight to the Unanderra–Moss Vale rail line by 2030. This complements Nerriga Road's role in diverting 30–40% east-west freight, achieving complete removal from B73/MVR271 while saving the network from deterioration. Short-term pilots, medium-term upgrades, and long-term expansions like Maldon–Dombarton ensure bidirectional capacity. Adding passenger services—addressing the lack of direct Moss Vale–Wollongong/Nowra links—further enhances connectivity, fostering eco-tourism and economic growth..

Image 24 "Star Struck Kangaroos", Art by Anna Glynn, Oil on canvas, 61cm x 51cm, 1996, https://www.annaglynn.com/

XIII Kangaroo Valley's Economy and Society

Hampden Bridge is more than a bridge. It is a celebrated icon of Kangaroo Valley. Anna Glynn's "Star Struck Kangaroos" much loved by all, sums up the synergy between the Valley and the Bridge. But on any day dozens of people stop and photograph Hampden Bridge and get a feeling for Kangaroo Valley.

When they experience the Valley as a unique sanctuary within two hours of Sydney's CBD, people come back and some even give up the city and come to live. The Valley is a place of significant Aboriginal Heritage. It contains a unique confluence of rivers and streams. It has a vibrant village and community. It has a strong and resilient farming community. There is a new economy of arts, film and culture emerging.

Kangaroo Valley was once exclusively defined by its agricultural roots—particularly dairy farming that shaped the landscape since the mid-19th century— now the valley is increasingly driven by tourism, eco-adventures, and service-based industries. This shift reflects broader trends in regional Australia, where traditional small acre farming faces challenges like deregulation, climate variability, and intense competition, at the same time natural ecological assets fuel sustainable growth in visitor economies and knowledge-based sectors.

Historically, agriculture was the backbone of Kangaroo Valley. The fertile river flats supported a thriving dairy industry from the 1840s, peaking in the mid-20th century with around 150 farms. However, national dairy deregulation in 2000 exposed small producers to volatile prices, leading to consolidation and decline. By 2025, only five active dairy farms remain, producing ~1.5–2 million liters annually per farm. The whole of the Shoalhaven agriculture sector contributes just $103 million in 2020/21, with milk comprising 70.7% of total production (Shoalhaven City Council Economic Profile, 2025). This represents a fraction of the region's total economy, underscoring agriculture's diminishing dominance.

In contrast, tourism has surged as the valley's primary economic engine. In 2023/24, total tourism sales in the Shoalhaven City Council (SCC) area reached $1,316.3 million, generating $602.6 million in value added (Shoalhaven City Council Economic Profile, 2025). For Kangaroo Valley specifically, this translates to a vibrant visitor economy worth $25–30 million annually, fueled by over 400,000 tourists drawn to the area's pristine rivers, escarpments, and heritage sites like Hampden Bridge. Activities such as kayaking (e.g., 3,000+ trips starting below the bridge, injecting $2.1 million directly), bushwalking on 27 official trails, and festivals (e.g., Kangaroo Valley Folk Festival attracting 8,000–10,000 attendees) create jobs in accommodation (150+ Airbnbs at 70% occupancy)[26], hospitality, and guided tours.

This pivot from agriculture aligns with Shoalhaven's broader diversification. While farming output has stagnated, sectors like health care, construction, and public administration have grown, supported by population influx (valley pop. ~880 in 2025, projected 1,450–1,700 by 2050). Emerging "hidden" contributors include high-value adding around HMAS Albatross (a naval aviation base near Nowra), which employs ~1,500 in aircraft maintenance, logistics, and advanced manufacturing—often undercounted in standard profiles but adding $200–300 million regionally through defense contracts and innovation (Shoalhaven Defence Industry

[26] For example, Rectory Parkway Cottage and the Old Bakery are booked at an even higher rate, almost every weekend of the year. Both of these accomodation options and many more based in the Village are affected by truck movements along B71.

Group, 2024). Similarly, creative ventures like Shark Island Films in Kangaroo Valley—a production hub for documentaries, events, and eco-films—boost arts/recreation, generating unreported income through film shoots, workshops, and tourism tie-ins (e.g., $1–2 million annually from location fees and visitor spin-offs).

These changes foster a "new economy" blending eco-tourism, wellness (yoga retreats, holistic therapies), and knowledge services (remote work in boutique stays). However, challenges persist: over-reliance on tourism risks seasonal volatility, while agriculture's decline threatens cultural heritage. Sustainable growth requires balanced infrastructure, like strengthening Hampden Bridge to support farms without disrupting eco-precincts.

Image 25 Tourism has always been an important and growing industry for Kangaroo Valley and the Shoalhaven Region of the South Coast. Above: Car beside a tourist directory sign, Kangaroo Valley, New South Wales, circa. 1935, NLA https://nla.gov.au:443/nla.obj-141984211

Shoalhaven Eco-Tourism Initiatives: Driving Sustainable Growth

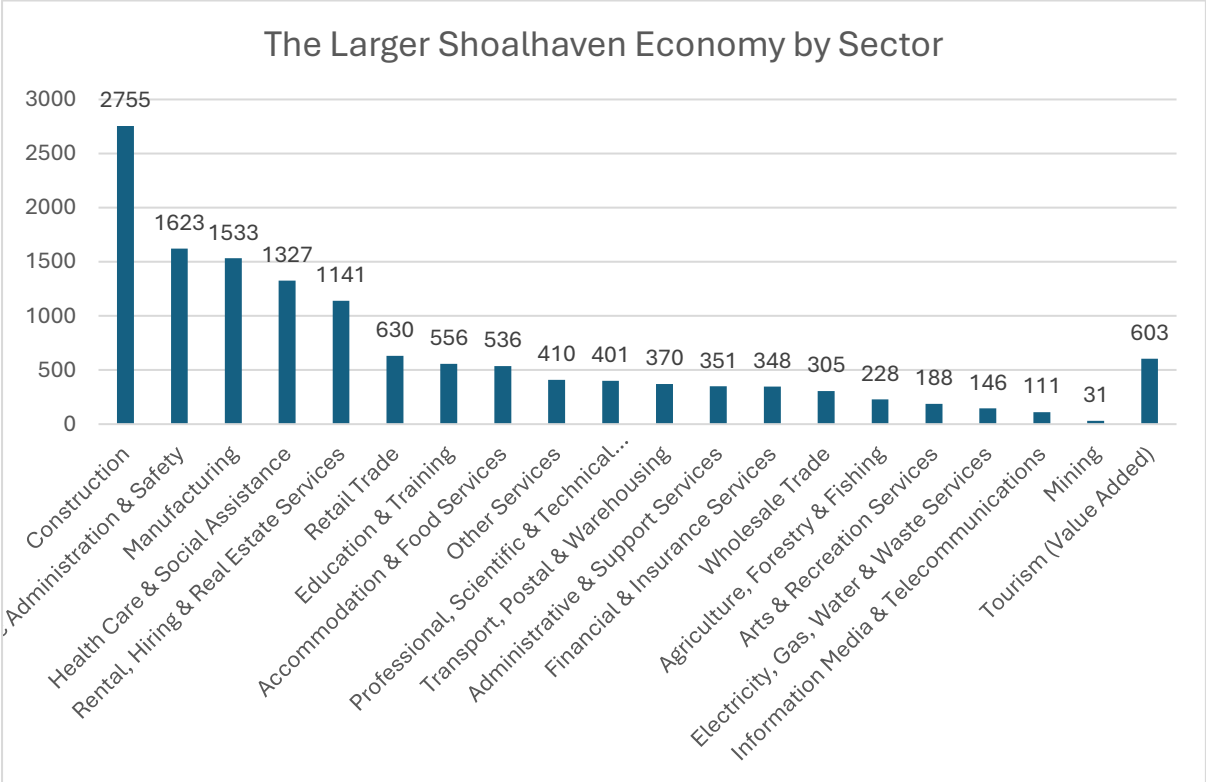
The Shoalhaven region actively pursues **eco-tourism** as a cornerstone of diversification, emphasizing low-impact development and habitat protection. Key initiatives include:

- **Sustainable Tourism Infrastructure Package** ($5.3M, 2019–ongoing): Upgrades eco-sites with boardwalks, viewing platforms, and signage (e.g., Drawing Room Rocks, Hyams Beach). Partners with Indigenous groups for cultural integration.
- **Economic Development and Tourism Strategy 2035** (review 2025): Prioritizes regenerative tourism, off-peak visitation, and ecosystem safeguards.
- **Many Experiences, One Destination Branding**: Promotes low-impact activities like river kayaking and national park trails.
- **Partnerships and Grants**: Supports events/workshops via funding, including NAIDOC and sustainability programs.

To visualize Shoalhaven's economy, the bar chart below shows output by sector in 2023/24 (total ~$12.1 billion; data from economy.id.com.au). Tourism overlaid as value-added ($603M), overlapping accommodation/food. Uncounted elements like HMAS Albatross (defense) and Shark Island (arts) add 5–10%.

Construction dominates at 22.7% ($2,755M), while agriculture is 1.9% ($228M). Tourism's $603M value added underscores its rising role.

Graph 4 The Larger Shoalhaven Regional Economy by Sector



This evolution positions Kangaroo Valley as a model for regional renewal: leveraging natural beauty for sustainable jobs while honoring agricultural heritage. Balanced policies—like protecting Hampden Bridge—are essential.[27]

Aboriginal Heritage

The Valley is Wodi Wodi country, part of the Dharawal Nation. For thousands of generations the Kangaroo/Shoalhaven river and a myriad of creeks and streams were 'roads' connecting coastal, highland and communities as far away as Sydney in the north and Eden in the South. The river flats were ceremonial grounds and meeting places. In 1836 James Backhouse, camped on the Kangaroo River, not far from the current site of the Hampden Bridge, an estimated group of 200 Aborigines were either regularly travelling through or resident in the Valley. (Backhouse pp.434-5) Aboriginal families led the Valley's first dairy farmer Charles Mc Caffrey and his wife into the Valley over Woodhill Gap in 1846. They were according to Mc Caffrey "ready to help in doing anything and everything" to aid these first settlers.(Griffith and Kangaroo Valley Historical Society (N.S.W.) p9) In 1890 the Valley was home to one of NSW's earliest Aboriginal schools. Inspired by the Maloga Mission model, Hughy Anderson (Yorta Yorta) and his wife Ellen Anderson (Dharawal), worked alongside King Mickey Johnson and Queen Rosie Johnson and their great-grandson John "Jacko" Johnson (Stan Grant's great-grandfather) to teach Dharawal/Wodi Wodi/Yuin children literacy, arithmetic, and their own language. Like Maloga, the school was to be part of a sustainable farming enterprise.(Cato) The school and reserve lay immediately behind today's Pioneer Farm, right beside the future site of Hampden Bridge.(P. Botsman) Kangaroo Valley Reconciliation Allies are continually working on ways to support links to local Aboriginal groups and communities. More and more Aboriginal events are being held including workshops.[28], NAIDOC events [29], corroborees[30], native bush food planting and gatherings. Thanks to the Reconciliation Allies, linked to the broader Shoalhaven Walking Together group, Kangaroo Valley Show also now includes talks by local elders as well as an acknowledgement of the *pioneering* Aboriginal families such as the Sinclairs who played a role in helping with the formation of farms and dairies and in creating a commercial centre on the Southern side of the Kangaroo River.(P. C. Botsman)

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[27] For background on KV's new economy: See Shoalhaven City Council (2025). *Economic Profile 2023/24* https://economy.id.com.au/shoalhaven; REMPLAN (2025). *Shoalhaven Industry Breakdown*. https://app.remplan.com.au/shoalhaven; Shoalhaven Defence Industry Group (2024). *HMAS Albatross Economic Impact Report*; Kangaroo Valley Tourism (2025). *Visitor Economy Study*; Shoalhaven City Council (2025). *Sustainable Tourism Infrastructure Package*. https://www.shoalhaven.nsw.gov.au/projects/sustainable-tourism; Shoalhaven City Council (2025). *Economic Development and Tourism Strategy 2035 Review*. https://getinvolved.shoalhaven.nsw.gov.au; Destination NSW (2025). *Many Experiences, One Destination Campaign*; Ulladulla Local Aboriginal Land Council (2025). *Cultural Tourism Partnerships*; Jervis Bay Wild (2025). *Indigenous Tours*. https://www.jervisbaywild.com.au; Kangaroo Valley Reconciliation Allies (2025). *Events and Workshops Reports*; NSW Government (2025). *Aboriginal Tourism Action Plan*. https://www.destinationnsw.com.au/aboriginal-tourism

[28] visitkangaroovalley.com.au/event/gangagruwan-corroboree-dance-workshop

[29] : southcoastregister.com.au and ulladullatimes.com.au articles on Shoalhaven NAIDOC events

[30] southcoastregister.com.au/story/9040923 (gallery and report).

A growing highlight of Shoalhaven tourism is **Indigenous-led eco-tourism**, embedding Dharawal and Yuin cultural knowledge into experiences while generating economic benefits for First Nations communities. Notable projects include:

- **Gulaga Tours and Cultural Experiences** (nearby Biamanga/Gulaga National Parks): Led by local Yuin elders, offering guided walks sharing Dreamtime stories, bush tucker, and traditional land management. Ties into Shoalhaven's branding for authentic cultural immersion.
- **Jervis Bay Wild Indigenous Tours**: Operated by Aboriginal guides, featuring dolphin cruises, bush tucker walks, and cultural storytelling in Jervis Bay—close to Kangaroo Valley, drawing shared visitors.
- **Ulladulla Local Aboriginal Land Council Partnerships**: Collaborations on sustainable infrastructure (e.g., interpretive signage at coastal sites) and events like NAIDOC week eco-activities.
- **Kangaroo Valley Reconciliation Allies**: Local group facilitating Indigenous-led events (e.g., corroborees, bush food planting, workshops), linking to broader Shoalhaven initiatives for cultural tourism.

These projects empower Traditional Owners, preserve knowledge, and add unique value to the visitor economy, aligning with NSW's focus on reconciliation through tourism.

In Kangaroo Valley, these align with operators like Kangaroo Valley Adventure Co. (guided eco-tours) and retreats (e.g., solar-powered sites). Initiatives enhance appeal while minimizing impacts, supporting $25–30M tourism.

There are many possible ways that local Yuin and Dharawal people can be part of the future Kangaroo Valley economy. Some of the current discussions include re-enacting the journeys that Charles Throsby made into the Valley on 29th March 1818 with Aboriginal guides Broughton and Timelong following Throsby's own diary notes; and also re-enacting the first dairy farm family's journey into the Valley - the Mc Caffrey's in 1846. These journeys were enabled by the local Kangaroo Valley Aboriginal community and mark a special generosity and hopeful beginning of shared history and prosperity.

Eco-system/eco-visitors

Kangaroo Valley is a unique confluence of rivers. Rivers and streams were the original roads. They not only went east and west, they went north and south and they flowed, sometimes, in parallel with each other. These rivers and streams were not only highways, they are a unique ecology. They provided food and pristine drinking water including providing Sydney with an important source of water through the system of dams and pumping stations operational for 48 years since 1977. (See Appendix G) There are at least ten major creeks including Bundanoon, Sandy, Yarrunga, Trimbles, Bowmans, Gerringong, Brogers, Sawyers, Mertyle and Nugents running into the Kangaroo River not to mention the dozens of un-named springs and rain fall oriented flows. For long term residents the river, creeks and springs are an endless source of wonder.

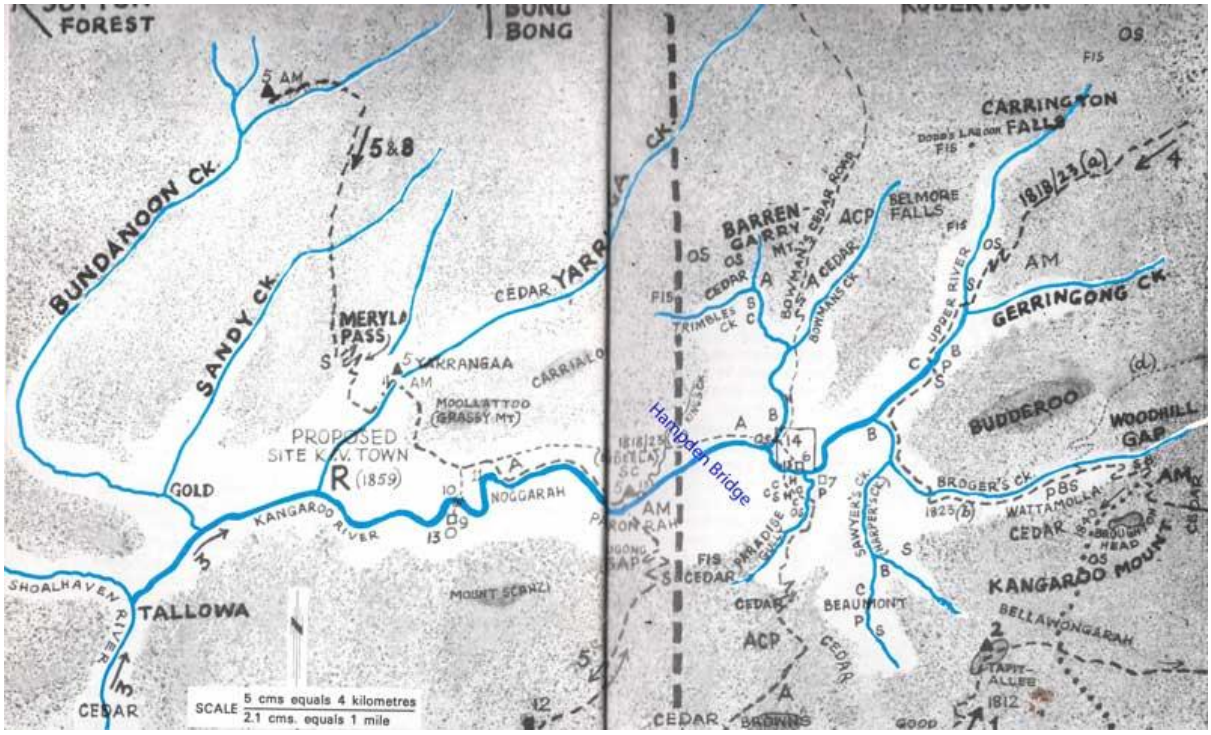

Image 26 The original roads: rivers and streams of Kangaroo Valley: Source (Griffith and Kangaroo Valley Historical Society (N.S.W.))

The creation of Tallowa Dam had a major impact on the environment of the Valley[31] and on the rivers and streams of the area. But the rivers and the walking tracks that define the contemporary Kangaroo Valley are still pristine and they provide the foundation of a very important Shoalhaven wide environmental strategy that is in turn part of a regional eco- tourism strategy. One good thing about this report is that it allows the possibility of creating greater recognition of the economic, cultural and environmental value of the Kangaroo River ecosystem and it unique relationships with international, national, regional and state wide ecosystems.

Hampden Bridge is at the centre of Kangaroo Valley's confluence of rivers and walking tracks. It is a point where visitors stop and begin either a walking or kayaking activity that in turn leads to the prospect of more activities.

Sometimes when transport plans are being developed rivers and streams are forgotten so it is important to note how they stem from the eight corners of Kangaroo Valley with its attendant

[31] See **Shoalhaven Environmental Flows Investigations (2006, NSW Department of Natural Resources/WaterNSW)**: Comprehensive review of downstream impacts, including water quality, thermal regime, fish passage, macroinvertebrates, and estuary health. It informed new environmental flow rules. Available via WaterNSW publications. **Longitudinal Effects of a Water Supply Reservoir (Tallowa Dam) on Downstream Water Quality, Substrate and Riffle Macroinvertebrate Assemblages (2009, published in Marine and Freshwater Research)**: Peer-reviewed study showing impacts on substrate, water temperature, and invertebrate communities up to 18 km downstream. **Fish Passage Study for Shoalhaven River Environmental Flows (2006, The Ecology Lab Pty Ltd)**: Assessed barriers to migration and recommended fishway solutions. **Post-Construction Ecological Assessments (post-2009 fish lift)**: Monitoring by NSW DPI Fisheries and WaterNSW evaluating fishway effectiveness and ongoing river health.
Natural Resources Commission Review (2021): Recommended reviewing transfer/release rules from Tallowa Dam to optimize environmental outcomes, highlighting drought-period flow reductions affecting the estuary and oyster industry.

waterfalls and environments. These “old roads” are places that urban and suburban visitors increasingly want to visit and explore by walking or kayaking or by doing both. The 27 “official” Kangaroo Valley walks are part of a much wider network of walking trails that traverse the Valley and may one day be part of the Greater Coastal walking trail that will run from Sydney to the Victorian border. The Valley is part of the 100 beach tourism strategy which is in turn part of the *Many Experiences, One Destination* strategy pioneered bythe Shoalhaven City Council.(Council) But there is much more to be done to really highlight why the Valley is special

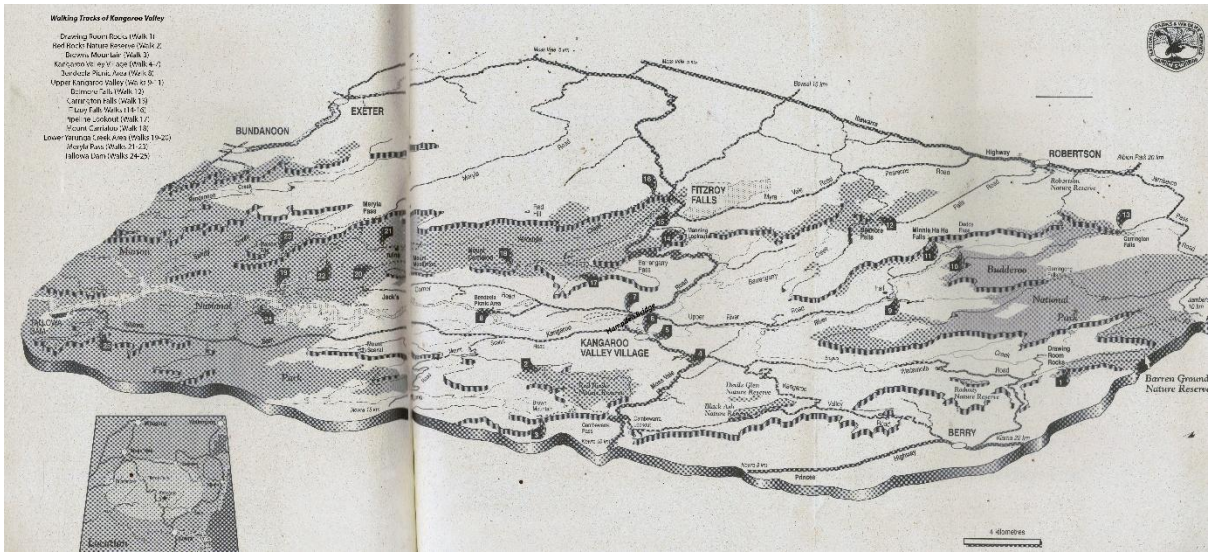

Image 27 Walking Tracks of Kangaroo Valley derived from (NSW National Parks and Wildlife Service and Andrews)

Why is Hampden Bridge important for this “eco-system” of rivers and streams, walking tracks and kayaking adventures? The pool under the Hampden bridge was the last known place the Kangaroo Valley Perch was caught.[32] This was a link to a once thriving ecology, Charles Throsby had originally observed “.. a great abundance of peculiar sort of fish such as the large spotted fish and a smaller and darker sort of Perch”. (Griffith and Kangaroo Valley Historical Society (N.S.W.) p.14)

The bridge is the centre of all of these things.

To use one direct example sourced from one local Kangaroo Valley canoe business. In 2025 over 3000 kayaking trips began below Hampden Bridge. This represents at minimum, a spend of $2.1 million in the local economy enabling jobs, flow on spending at local businesses and flow-on effects for local accommodation and more. The direct effect of $2.1 million on kayak hires, leads to a direct gross value added (GVA) sum of $0.70 million (using a direct GVA ratio of 0.335 per dollar of tourism consumption from NSW data). The spend also allows 7 full-time equivalent (FTE) jobs (based on 3.24 direct jobs per $1 million in tourism spend), primarily in kayak operations, guiding, and maintenance.[33] On top of these direct spending effects there is also flow on spending or “externalities”. This includes a gross value added flow on spend of $1.46 million (total GVA multiplier of 0.693). with flow on spending being: $0.76 million. In addition

[32] See Alex Pike, “The Forgotten Fish” on vimeo https://vimeo.com/984189834?share=copy&fl=cl&fe=ci
[33] Derived from Tourism Research Australia, *State Tourism Satellite Account 2023–24* (Austrade, 2025). Key ratios: direct GVA ~0.335; total GVA multiplier ~0.693; total employment ~5.45 jobs per $1 million tourism consumption. Available at: https://www.tra.gov.au/en/economic-analysis/tourism-satellite-accounts/state-tourism-satellite-account

flow on spending at local businesses is estimated at $0.75 million in indirect/induced output (derived from an output multiplier of ~1.7).[34] and additional spending in the accommodation and related sectors is an estimated $0.4–0.6 million in indirect accommodation-related demand (accommodation/food services typically capture ~25% of flow-on effects). This supports a total of 11-12 full time equivalent (FTE) positions including 4-5 indirect jobs.][35]

Table 23 Local Kayak Tourism Gross Value Added, Jobs Spending

Metric	Direct	Externalities (Indirect + Induced)	Total
GVA ($ million)	0.70	0.76	1.46
Jobs (FTE)	7	5	12
Output/Flow-On Spending ($ million)	2.10	0.75	2.85

Many visitors stop to photograph the bridge and enjoy the possibility of a swim, a platypus tour, accommodation, walking trips, the Pioneer Museum and Farm and of course kayaking. A dual carriageway, either temporary or permanent alongside the heritage Hampden bridge would disrupt all this forever. Some might argue that amendments could be made to stop the damage, but with far less investment, changes can be made to enhance the heritage bridge with far greater environmental, ecological and sheer road damage The bridge is now a natural place to stop and appreciate the unique sanctuary of Kangaroo Valley.

In the future the Great Coastal Walk & Paddle Trail – will become a catalyst for many Kangaroo Valley activities. The Great South Coast Walk will be Australia's longest coastal trail – from Sydney(NSW) to Warrnambool (VIC), divided into many stages.

Kangaroo Valley and Hampden Bridge could be an undisputed inland mid-point for the NSW upper South Coast section:

- Day 18–22 of the southern NSW segment (linking Jamberoo and Robertson with Jervis Bay).

[34] Destination NSW, *NSW leads 2023-24 State Tourism Satellite Account* (2025). Confirms statewide totals supporting multiplier calculations. Available at: https://www.destinationnsw.com.au/newsroom/nsw-leads-2023-24-state-tourism-satellite-account

[35] Invest Shoalhaven, *Record Off-Season Visitor Spending - Visitation Drives Jobs and Economic Growth* (2025). Reports Shoalhaven annual visitor economy ~$1.42–1.5 billion supporting ~6,000 jobs; informs regional leakage adjustment. Available at: https://investshoalhaven.com/record-visitor-spending-visitation-drives-jobs-and-economic-growth/ and Shoalhaven City Council (via Mirage News), *Shoalhaven Launches Its 2026 Travel Guide* (2025). Updates visitor economy scale for regional context. Available at: https://www.miragenews.com/shoalhaven-launches-its-2026-travel-guide-1592496/

- The only significant inland river crossing between Royal National Park and Gippsland lakes.
- The place where walkers and paddlers will restock, repair blisters, book a massage, eat three meals a day in the village, do sunrise yoga on the northern bank, and decide this is where they want to live and raise children.

The Kangaroo Valley trails features pristine beaches, coastal lakes, sea cliffs, native forest, heathland, and abundant wildlife, with variants for low tide crossings and water taxis.[22] Hampden Bridge, 1898, will be one of the trail's singular iconic images – the heritage timber arch framed by sandstone cliffs and rainforest, the pause where the trail's rhythm slows and the Valley's heartbeat takes over.

At the centre of all this is something that is impossible to value the Kangaroo Valley eco-system.

The **Kangaroo River** hosts both of Australia's living **monotremes** — the platypus (*Ornithorhynchus anatinus*) and the short-beaked echidna (*Tachyglossus aculeatus*). These egg-laying mammals represent an ancient lineage dating back over 200 million years, surviving alongside dinosaurs and diverging from other mammals early in evolution.[36]

The river's diverse habitats also support other iconic species like the superb lyrebird (*Menura novaehollandiae*), common wombat (*Vombatus ursinus*), and the rare brush-tailed rock-wallaby (*Petrogale penicillata*), all contributing to the valley's rich biodiversity and ecological balance.

Platypus in the Kangaroo River

Platypuses have long inhabited the Kangaroo River's clear, flowing waters, deep pools, and rocky banks. Indigenous Dharawal and Yuin peoples incorporated them into Dreamtime stories, viewing them as hybrid creatures.

European records from the 19th century describe them as common in upland rivers like the Kangaroo. Despite threats from fur hunting (until protection in the early 20th century), habitat clearing for dairy farming, and modern issues like Tallowa Dam (1976) altering flows and blocking migration, platypuses persist.

Today, sightings occur regularly near Hampden Bridge, Bendeela, and upper reaches. The **Platy-project**[37], a citizen science initiative launched in 2022 by the Australian Conservation Foundation in partnership with groups like UNSW and EnviroDNA, engages volunteers to report sightings and collect eDNA (environmental DNA) samples from water to detect platypus presence. In Kangaroo Valley, the project compares historic vs. current sightings to assess survival rates, with maps showing recent detections in the upper river. eDNA sampling (e.g., in spring/autumn) filters water for platypus DNA, confirming populations despite threats like droughts and fires. This monitoring has shown encouraging numbers, aiding adaptive conservation like habitat restoration.

Platypuses forage at dawn/dusk using electroreception in their bills, contributing to river health by controlling invertebrates.

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[36] Grant, T.R. (2015). *The Platypus: A Unique Mammal*. CSIRO Publishing. (Historical and ecological context).

[37] Australian Conservation Foundation (2024). Platy-project Annual Report. Available at: https://www.acf.org.au/platy-project. (Citizen science and eDNA details).

Echidna in the Kangaroo River Area

The short-beaked echidna, Australia's most widespread native mammal, thrives in Kangaroo Valley's diverse habitats — forests, woodlands, grasslands, and heathlands surrounding the river.

Shy and solitary, echidnas dig for ants and termites with powerful claws and long sticky tongues. They appear in local lore as ancient survivors.

Annual Echidna Counts (organized by the Kangaroo Valley Environment Group since at least 2023) track sightings during breeding season (August–September), with records from western valley areas and roadsides.

Sightings occur near Bendeela campground and bushland, often during tours spotting wombats and kangaroos. Threats include vehicles, foxes, and habitat loss, but populations remain stable.

Other Key Species: Lyrebirds and Wombats – Ecosystem Engineers

The Kangaroo Valley's forests and riverine habitats support the superb lyrebird and common wombat, both vital "ecosystem engineers" that shape the environment.

Superb Lyrebird: Known for mimicry (imitating up to 20 bird species and sounds like chainsaws), lyrebirds forage by raking soil, moving 155 tonnes per hectare annually — more than any other land animal. This aerates soil, buries litter to hasten decomposition, creates microhabitats for invertebrates, and reduces bushfire risk by lowering fuel loads. In Kangaroo Valley, they're common in rainforests and eucalypt woodlands (e.g., Morton National Park), aiding nutrient cycling and post-fire recovery. Their behavior "farms" the forest floor, benefiting prey species and overall biodiversity.

Common Wombat: These sturdy marsupials dig extensive burrows, aerating soil, improving water infiltration, and aiding nutrient turnover. Burrows provide shelters for other species (e.g., insects, reptiles), act as firebreaks, and facilitate seed dispersal/carbon sequestration by burying organic matter. In Kangaroo Valley, wombats are abundant in grasslands and forests (e.g., Bendeela area), supporting ecosystem resilience. Their engineering prevents erosion and enhances habitat diversity, crucial in fire-prone regions like post-2019–20 Black Summer.

The Rare Brush-Tailed Rock-Wallaby in Kangaroo Valley

The endangered brush-tailed rock-wallaby (*Petrogale penicillata*) inhabits Kangaroo Valley's steep sandstone escarpments and rocky outcrops. Once widespread across eastern Australia, populations have declined over 70% due to habitat loss, predation (foxes, cats), and competition from feral goats. In the valley, a small, fragmented group clings to survival in areas like Morton National Park and private lands, feeding on native grasses, shrubs, and foliage. Their agility allows them to navigate cliffs, escaping predators and accessing niches. As a "flagship species," they indicate ecosystem health — their presence signals intact rocky habitats supporting diverse flora/invertebrates. Conservation is critical, as local extinction could disrupt seed dispersal and vegetation dynamics.[38]

[38] NSW Department of Planning, Industry and Environment (2022). Saving our Species Program: Brush-tailed Rock-wallaby. Available at: https://www.environment.nsw.gov.au/savingourspecies. (Conservation strategies).

Morton National Park: The Backbone of Kangaroo Valley's Ecosystem

Morton National Park (est. 1967, 199,745 ha), encompassing much of Kangaroo Valley's escarpments and upper catchment, is a biodiversity hotspot protecting habitats for monotremes, lyrebirds, wombats, and rock-wallabies.[39] Its sandstone plateaus, deep gorges, and rainforests (e.g., eucalypt woodlands, heathlands) provide refugia from threats like fire and development. The park buffers the Kangaroo River, maintaining water quality and flows essential for platypuses. It supports ~400 bird species (including lyrebirds), 100 mammals (echidnas, wombats, wallabies), and rare flora. As part of the Greater Blue Mountains World Heritage Area (adjacent), it aids connectivity for species migration. Conservation includes fire management trails, pest control, and restoration post-2019–20 fires (recovering ~70% of burned areas by 2025). Eco-tourism (e.g., Fitzroy Falls walks) generates $10M+ annually, emphasizing the park's role in sustaining the valley's ecosystem services like soil stability, water filtration, and carbon storage.

Conservation Efforts in Kangaroo Valley

Kangaroo Valley's ecosystem faces threats from climate change, invasive species, and development, but robust conservation efforts protect its biodiversity. Local groups like the Kangaroo Valley Environment Group (KVEG, est. 2005) lead habitat restoration, weed control, and wildlife monitoring, comparing historic and present data. KVEG partners with Landcare Australia for revegetation along riverbanks to prevent erosion and support species like platypuses. The Friends of the Brush-tailed Rock-wallaby (est. 1994) focuses on the wallaby, conducting fox baiting, goat culling, and population surveys in escarpments; their "Save the Rock Wallaby" program has stabilized numbers through predator-proof fencing and community education, integrating with Morton NP's pest management.[40]

Broader NSW initiatives include the Saving our Species program (NSW DPIE), classifying the brush-tailed rock-wallaby as "Site-managed" with targeted actions like translocation and monitoring in Morton NP. For monotremes, the Platypus Conservation Initiative (ACI/UNSW) collaborates locally, using eDNA for non-invasive surveys. KVEG's annual "BioBlitz" events engage citizens in spotting lyrebirds, wombats, and wallabies, fostering stewardship.

[39] Morton National Park Management Plan (2021). NSW National Parks and Wildlife Service. Available at: https://www.nationalparks.nsw.gov.au/morton-national-park. (Park's role in biodiversity).
[40] Kangaroo Valley Environment Group (2023). Annual BioBlitz Report. Available at: local community website or upon request. (Local monitoring efforts).

eDNA Sampling Methods: Environmental DNA (eDNA)[41] is a revolutionary, non-invasive tool for detecting elusive species like platypuses and wallabies. In Kangaroo Valley, methods involve collecting 1–2 liter water/soil samples from pools, burrows, or escarpment seeps, comparing historic and present data. Samples are filtered through 0.45-micron membranes to capture shed DNA (skin cells, feces, urine). DNA is extracted using kits (e.g., Qiagen DNeasy), amplified via PCR with species-specific primers (e.g., cytochrome b for platypus, mitochondrial genes for wallaby), and sequenced (e.g., Illumina MiSeq). Analysis identifies presence/absence, often within days, at ~$50–100/sample. Platy-project volunteers use portable samplers, contributing data to national databases. For rock-wallabies, eDNA from scat/water has detected isolated groups in Morton NP, guiding targeted protections like riparian fencing and comparing with non-dammed rivers.[42]

These efforts enhance resilience: KVEG's 2023 revegetation planted 5,000 natives, aiding lyrebird foraging and wombat burrows. The park's fire management trails protect wallaby habitats, with post-2019–20 recovery replanting 10,000 trees. Overall, they maintain the valley's biodiversity hotspot status, supporting renewable eco-tourism ($2–3M annually from wildlife spotting) and ecological balance.

David Attenborough's Filming in Kangaroo Valley

Sir David Attenborough highlighted the region's monotremes in his 2002 BBC series *The Life of Mammals* (Episode 1: "A Winning Design").[43]

In 2001, he visited Kangaroo Valley to film platypuses in the river's pools, capturing rare footage of their foraging and swimming. He collaborated with local guides, staying on a private property where the crew also spotted echidnas and other wildlife.[44]

The episode showcased the platypus's evolutionary quirks — electroreception, venomous spurs, and egg-laying — filmed against the valley's pristine backdrop. This brought global attention to Kangaroo River monotremes, boosting conservation awareness and eco-tourism.[45]

The Valley Farming Industry 1846–2026

2026 is the 180th anniversary of the establishment of the first European dairy farm in Kangaroo Valley. The Valley's farms and farming families are loved, valued and respected. The loss of one farm has a catastrophic effect on the Valley and cannot be valued in numeric or monetary terms. Farms are the heart and soul of our community.

Dairy farming has shaped Kangaroo Valley's landscape, economy, and community since European settlement. Kangaroo Valley Dairy Farms have always been innovators. The fertile river flats and reliable rainfall made the Valley ideal for dairying, transforming it from dense rainforest into productive pastures. This section traces the industry's rise following land reforms

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[41] EnviroDNA (2024). eDNA Sampling Protocols for Australian Wildlife. Available at: https://envirodna.com/resources. (Technical methods for eDNA)
[42] Friends of the Brush-tailed Rock-wallaby (2024). Annual Conservation Update. Available at: https://rockwallaby.org.au. (Wallaby-specific efforts).
[43] Attenborough, D. (2002). *The Life of Mammals* (BBC Series). Episode 1: "A Winning Design." (Filming details).
[44] ABC News (2001). "Attenborough Films in Kangaroo Valley." Archival report. (Local coverage of visit).
[45] Landcare Australia (2023). Kangaroo Valley Revegetation Project Report. Available at: https://landcareaustralia.org.au/projects/kangaroo-valley. (Restoration initiatives).

in the 1860s, its mid-20th-century peak, and its sharp decline after national deregulation in 2000, leaving just five active farms today.

Early Settlement and the Robertson Land Acts (1846–1900)

The first European settler, Charles McCaffrey, arrived in 1846 with his family, guided by Aboriginal people. He established a small dairy operation on land granted to Henry Osborne, exporting butter beyond the Valley and laying the foundation for commercial dairying. (Griffith and Kangaroo Valley Historical Society (N.S.W.))

The Robertson Land Acts of 1861 (Crown Lands Alienation Act and Crown Lands Occupation Act) dramatically accelerated settlement.[46] These reforms, championed by Premier John Robertson, allowed "free selection" of Crown land in 40–320 acre blocks, breaking the squatters' monopoly and encouraging small-scale farming. In Kangaroo Valley and nearby areas like Robertson and Kangaloon, selectors cleared the dense "Yarrawa Brush" rainforest for pasture.[47]

High rainfall and rich soils supported intensive dairying. By the late 19th century, the Valley emerged as a key butter and cream producer, with cooperative factories processing milk locally. The introduction of **mechanical cream separators** in the 1880s and the co-operative movement revolutionized processing. Kangaroo Valley established local **co-operative butter factories** (e.g., in Kangaroo Valley and Barrengarry) from the late 1880s onward, allowing farmers to supply cream rather than whole milk. These factories preserved and stored production centrally, producing high-quality butter for Sydney/South Coast markets. The "Kangaroo" co-operative was part of regional mergers forming brands like Allowrie.[48]

The opening of **Hampden Bridge** in 1898 improved transport to markets in Sydney and the South Coast, boosting the industry further.

Peak and Consolidation (1900–1980)

Dairying reached its height in the early to mid-20th century. Post-Federation improvements in refrigeration, rail transport, and cooperative models (e.g., Illawarra dairies) enabled reliable supply to urban markets. The Valley's mild climate and river access supported large herds on family farms.

At its peak in the mid-20th century, Kangaroo Valley supported around **150 dairy farms**, part of the broader Illawarra-Shoalhaven region's thousands of operations.[49] These small-to-medium family enterprises defined the Valley's rural character, with green pastures visible from Hampden Bridge and along the Kangaroo River.

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[46] See National Museum of Australia online exhibition: https://www.nma.gov.au/defining-moments/resources/robertson-land-acts

[47] See https://www.southernhighlandnews.com.au/story/7091743/thick-bush-cleared-in-1860s-for-settlement-at-kangaloon/

[48] Southern Highland News (2018): Milk and butter business grew through co-operation. https://www.southernhighlandnews.com.au/story/5632353/butter-creams-competition/; Rimping Blog (2023): Allowrie History.

[49] Estimated peak from regional histories (Illawarra-Shoalhaven dairy snapshots); exact Valley figures ~100–150 at mid-20th century height.

Challenges emerged gradually: urban expansion pressures, labour shortages post-WWII, and competition from larger Victorian producers. Yet cooperatives and regulated pricing sustained viability until the late 20th century.

Deregulation (2000–2025)

National dairy deregulation on 1 July 2000 removed farmgate price controls for drinking milk and state marketing arrangements.[50] Intended to increase efficiency and competitiveness, it exposed farmers to volatile global prices and supermarket power.

In NSW, particularly the South Coast, the impact proved severe. Drinking milk premiums vanished, farmgate prices fell sharply (often below production costs), and many smaller operations became unviable.[6] Nationally, dairy farm numbers halved in the decade following deregulation; in regional NSW like the Shoalhaven, the decline was steeper due to higher costs and proximity to urban markets.

While the new environment created innovations, the unpredictability of the market created many pressures.

Kangaroo Valley felt this acutely. From many farms in the 1990s, numbers dropped rapidly. By the early 2010s, only a handful remained, and today (2025) just **five active dairy farms** operate in the Valley Surviving operations (e.g., multi-generational farms like those of the Chittick, Cochrane, Good, Parrish and Walker families) have scaled up herds (300–400+ cows), innovated and diversified feed (e.g., corn cropping) to remain viable. [51]

All of the Kangaroo Valley dairy farmers have been innovators.[52]

The decline reflects broader trends: consolidation into larger farms, urban/rural-residential subdivision pressures, and competition from irrigated mega-dairies elsewhere. Yet the remaining farms preserve the Valley's pastoral heritage, maintaining open landscapes that underpin eco-tourism.

Climate change

After the Currowan fires even veterans of the Kangaroo Valley farm community knew it was a lucky escape from disaster for the whole town. For dairy farmers in those dry times the price of feed was crippling. It rose to $500 a tonne and grain to $490 a tonne. Dairy Farm elder Garth Chittick and other Valley dairy farmers saved all his milkers from the fires, but there were fears for the future of farming in a once-lush area. The normally-green and highly productive Kangaroo Valley is bordered by rainforest, which was dangerously dry. Mr Chittick's herd has dropped by a third to just 250 milking cows, with feed costs having risen to $500 a tonne and grain at $490 a tonne. "For the last five years we've been below the average rainfall, and this year we got half our

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[50] **Commonwealth's Administration of the Dairy Industry Adjustment Package Audit Report No. 36, 2003-2004**
https://www.aph.gov.au/Parliamentary_Business/Committees/Joint/Completed_Inquiries/jcpaa/auditor_generals/chapter4

[51] See Holly McGuiness, "Kangaroo Valley dairy farmers finding security through corn in unpredictable weather**", South Coast Register** January, 2024

[52] See this feature on the Parrish dairy, with Trevor Parrish known as a national leader in innovative farming techniques: https://www.abc.net.au/news/2025-05-05/australian-farmers-breed-heat-tolerant-cows-using-genetic-index/105134068 Also Geoff Good pioneered corn as a silage crop in Kangaroo Valley https://www.southernhighlandnews.com.au/story/8771306/kangaroo-valley-dairy-farmer-geoff-goods-corn-silage-success Also see (Le Lievre) on the innovative Chittick Dairy Farm at Pyree.

average rainfall. We got 563mm against what should be 1,200mm. We've got to see what the future holds and I'm not as confident as I used to be. There are only five dairy farms left in Kangaroo Valley — how many there'll be in a few years' time, I don't know." (Locke)

Crop farming and Meat Cattle Production

As well as dairy, farms are contracting to specialist crop production such as potatoes which are famous in the area. Turning out meat cattle is also a supplement and an alternative for smaller acre farming. The local transport companies that support the transfer of cattle to local saleyards and to our thankfully still small and regional abbatoirs are also highly values and respected. Australia is not yet like the United States or Europe with enormous meat processing plants, rail and freeway based mass production. So it is important that we hang on to our local salesyards, abattoirs and local butchers.

Though these farms may not be about big numbers and are not top of vision for agribusiness they play a vital role as land guardians and stewards. Over time it is being recognised by environmentalists and farmers alike that they are allies, not enemies, with a common goal: the preservation of our unique Kangaroo Valley ecosystem and particularly our pristine rivers and streams.

Farming is changing

As younger generations take over from their fathers and grandfathers armed with agronomy degrees and ambitious about the future, farming is changing. Young people who once may have recoiled from the seven day weeks and long working days are coming back to farming.

Similarly local organic and vegetable farms play an important role in educating young people and potential farmers about plants, organics, vegetable production and sustainable, high quality food. (Farm)

Sometimes not acknowledged, carbon farming is also of great importance for Kangaroo Valley. Our local forests, which have returned since the 1900s, are the quiet protectors of Valley water and our local animals and birds. They are vital for Sydney's water catchment and link up to a network of national parks that are the great jewels of the Australian environment. National parks and wildlife need all the help they can get managing these natural assets. Understanding local bushfire conditions and the take over of eucalypts and other fast burning oil based trees from the older cedar forests(Heighes and Heighes) is something that local farmers have long played a role in supporting and understanding.(Heighes)

Small is not a dirty word. Kangaroo Valley will always be about protecting the interests of smaller farms, be they dairy, vegetable, cattle or timber/carbon sequestration farms.

Current Contribution and Future

In economic terms five farms produce significant milk volumes, supporting local processors and contributing to the Shoalhaven's ~$50 million plus dairy gross value product.[53] These farms also sustain hundreds of acres of lands —visible from Hampden Bridge—and our ecosystem by creating sustainable pastures. Strengthening Hampden Bridge to handle 42.5 tonne trucks to support milk tankers and fodder supplies is vital for these farms' ongoing viability, preventing

[53] Shoalhaven City Council Economic Profile In 2020/21, the total value of agricultural output in "Shoalhaven City" was $103m. The largest commodity produced was Milk, which accounted for 70.7% of Shoalhaven's total agricultural output in value terms. https://economy.id.com.au/shoalhaven/value-of-agriculture

detours and ensuring the Valley's dairying legacy endures. Smaller farms also make a major contribution to the well being of our community and the appeal of our Valley to visitors. But there is a critical distinction here in that regional trucking companies have an interest in using the Valley for fast through traffic that is not sustainable.

The needs of local farms and farming supply companies based in the Valley are at the mercy of big logistics companies and it is important that as many alternatives to through freight along the east/west corridors and by rail are found. Working out ways that smaller trucks can make deliveries and managing the logistics of their visits is something that has been barely explored. But all Valley residents have an interest in ensuring that this occurs in the future as there are implications for Valley merchants and the post office. The weight limits around Hampden Bridge are simply not the issue here. It is important that the Valley community are not hood winked into thinking that their interest are the same as transport companies who have an interest in simply pursuing short term goals at a price for everyone else.

The Valley Village Economy

Hampden Bridge is the symbol adopted by many Kangaroo Valley community groups and organisations as their emblem. It is an icon that is known throughout Australia and it is a symbol of an ongoing economic, social and cultural identity. While Berry, Cambewarra Mountain, Moss Vale, Bowral and Mittagong are carved into new subdivisions almost weekly, while the South Coast and Southern Highlands quietly fuse into the outer rings of a vast Greater Sydney, the Valley remains held gently by an array of national parks and sandstone escarpments.

The Valley has never been just one thing.

- Five-generation dairy families still milk on the same river flats their great-great-grandfathers cleared.
- Ison's of Nowra – the great symbolic and practical hardware, landscaping and building-supply partner of the Valley for 120 years – still delivers fencing wire, stock feed, chainsaw parts, cement, timber and plumbing fittings several times a week, keeping farms and building sites running.
- The Red Shed – the iconic local hub where farmers, tradies and weekenders come to buy hay bales, get advice about irrigation, or arrange local deliveries of building materials – is just as busy, a daily meeting place for the whole Valley.
- Local tradies – plumbers, sparkies, chippies, concreters – are flat-out renovating 100-year-old weatherboard cottages and building the new small estates on the northern side.
- Kangaroo Valley Public School has grown from 68 pupils in 2018 to 112 in 2025 and keeps rising.
- The tennis courts, netball court, showground, Rural Fire Service shed and ambulance station are busier than in living memory.
- The Upper River Hall is regularly packed for Shark Island Films screenings, live music nights, and community meetings.
- 150+ Airbnbs and boutique stays run at 70 % annual occupancy.
- The Pioneer Museum and Farm draw 3,000 visitors a year.

- A passionate motorcycle community rides the mountain passes every weekend, stops at the Friendly Inn beer garden or JKV cafés, and pumps an estimated $2–3 million a year into the village economy.
- Paddle & Portage Canoes (family-run, sponsors of the famous Canoe Carry Race), Kangaroo Valley Safaris and Wilderness Experience Training hire out more than 3,500 canoes and kayaks a year.[10]
- The caravan parks – Kangaroo Valley Tourist Park, Holiday Haven, and Bendeela Camping & Picnic Area – are key places that support the various festivals and offer a unique place to stay for families with stunning views of the river and the escarpments, providing affordable, nature-immersed accommodation that keeps festival-goers coming back year after year.
- Cafés line Moss Vale Road: The General Store Café (Thursday–Tuesday, consistently one of regional NSW's best), The Lantern, Maddison's, Valley Cheese Shop – though the much-loved Jing Jo closed in late 2024, leaving a gap locals still mourn.

Kangaroo Valley's cultural calendar is world-class and growing:

- Kangaroo Valley Folk Festival (October) – three days of pure magic: 8,000–10,000 people dancing barefoot on the showground under a sky thick with stars, banjos and bodhráns echoing off the escarpment, wood-smoke and mulled wine drifting across the river flats.
- The Kangaroo Valley Show (February) – the Valley's rural soul on full display: axe-splitting, grand parade, children in white coats, the legendary Paddle & Portage Canoe Carry Race across the bridge, Dagwood dogs, scones, dust, laughter, and the whole community together under the grandstand at sunset watching the rodeo compered by Keith Nelson, Laurie Barton or David Kent. First held in 1882 on the river flats behind the Friendly Inn, the Show is one of the oldest continuously running agricultural shows in NSW. It moved to its present showground in 1908 and has never missed a year except during the two world wars. The famous Paddle and Portage Canoe Carry Race began in 1978 as a wager between local farmers and canoe-hire operators – now, along with the hay stacking challenge, is one of the Show's signature events, drawing thousands and raising thousands of dollars for community projects since 2000.
- Summer Carp Competition – every January the riverbank fills with families and anglers for the biggest carp weigh-in south of Sydney, kids chasing monster fish, prizes, sausages on the barbecue, and the Friendly Inn packed to the rafters – a perfect Valley tradition that keeps the river alive and the village buzzing through the hottest months.
- Classical Music Festival, Sculpture in the Valley, Blues & BBQ, Oktoberfest, legendary Easter Saturday Pig Races (Anthony Baconese, Jacqui Lamb, Scott Morris-ham), Valley Art Trail & Open Studios.

And the Valley has quietly become a haven for alternative and holistic living:

- Weekly yoga in the Valley Hall, pioneered by Rose Andrews – a certified Iyengar Yoga teacher who has been quietly teaching in Kangaroo Valley for over a decade, following in the tradition of her mentor Susan and the rigorous Iyengar lineage that emphasises precision, breath, and alignment.

- Saturday tai chi in the Upper River Hall, weekly sound-bath meditations, women's circles under the full moon, men's breath-work groups at sunrise.
- Physiotherapists, naturopaths, acupuncturists, remedial massage therapists, and reiki practitioners with month-long waiting lists.
- Permaculture smallholdings and intentional micro-communities tucked into the folds of the valley.

Weddings – one of the Valley's quiet economic superpowers:

- Brides at St Joseph's Catholic Church or Christ Church Anglican (both heritage gems on the B73 Moss Vale to Nowra Road).
- Receptions at Kangaroo Valley Bush Retreat, The Heavens, Melross and a dozen other breathtaking venues.
- The iconic photograph on Hampden Bridge itself – the couple framed by the 1898 timber arch, river glinting below, cliffs glowing gold.
- Six to eight weddings every big Saturday, injecting hundreds of thousands of dollars into accommodation, cafés, the Friendly Inn, and the tradies who maintain the venues.[20]

XIV Appendices

Appendix 1 – Timelines and Options

This timeline simply demonstrates that the fastest and most efficient option is in situ strengthening of Hampden Bridge beginning in 2026.

Table 24 Kangaroo Valley Crossing Options Timelines

Option	2026 months	12 months	24 months	48 months	72 months
1. In-situ strengthening	Design	Phase 1 works	42.5 t restored	Full seismic	–
2. Temp military bridge	Design	Temp bridge up	Temp bridge down	New bridge planning	New bridge open
3. New concrete bridge	Planning	EIS	Construction start	Construction	Open
4. Do nothing	Hampden Bridge unable to handle contemporary traffic loads	23 tonne or less for Hampden Bridge crossings	Diversion of all through heavy trucking away from B73/MR261	Unknown	Unknown

Appendix 2 – Ernest Macartney De Burgh (1863–1929) and Kangaroo Valley

It is an over sight of history that Ernest de Burgh is not more associated with his “Bridge over the Kangaroo River”. ("The Hampden Bridge over the Kangaroo River, Moss Vale to Nowra") There are probably many reasons for this. Alan Clark’s **The Hampden Bridge Story** (Clark) published by the Kangaroo Valley Historical Society for its centenary in 1998 added to the appreciation of this engineer who acted as a mentor to the more famous J.J.C. Bradfield. But much more should be written about de Burgh.

The Australian Dictionary of Biography tells us that Ernest Macartney de Burgh was born on 18 January 1863 at Sandymount, Dublin, Ireland, the youngest son of Rev. William de Burgh and his wife Janette, née Macartney. He was educated at Rathmines School and the Royal College of Science for Ireland, and for a time was engaged on railway construction in Ireland.

He arrived in Melbourne on 21 March 1885 aboard the *Orient* and joined the New South Wales Department of Public Works on 30 April 1885. He worked on survey work for Sydney's southern outfall sewer, then on bridges over the Murrumbidgee and Snowy rivers. He became supervising bridge engineer in 1891, engineer for bridges in 1901–03, acting principal assistant engineer for rivers, water-supply and drainage from 1 July 1903 (confirmed in 1904), chief engineer for harbours and water-supply from 16 April 1909, and chief engineer for water-supply and sewerage from 26 February 1913.

De Burgh supervised construction of bridges over the Darling at Wilcannia and Wentworth, the Murray at Albury, Corowa, Mulwala, Koondrook and Swan Hill (Victoria), the Murrumbidgee at Wagga Wagga and Darlington Point, the Hunter at Singleton and Morpeth, the Macleay at Kempsey, and the Tweed at Murwillumbah. He served on the Sydney Harbour Bridge Advisory Board, studied dam construction in England and France, and was responsible for Cataract Dam and the royal commission for its project. In 1910–13, he represented the state government at engineers' conferences leading to the River Murray Waters Act. He was associated with Leslie Wade in the design and construction of Burrinjuck Dam and the Murrumbidgee Irrigation Scheme. He was responsible for the Cordeaux, Avon, and Nepean dams (Sydney water-supply), the Chichester scheme for Newcastle, and the Umberumberka scheme for Broken Hill. In 1921–25, he was a member of the Federal Capital Advisory Committee and prepared original plans for Canberra's water-supply. He was a member of the Institution of Civil Engineers, London, and twice won the Telford premium.

He retired on 22 November 1927, regarded as one of Australia's ablest civil engineers. His last year in office was marred by illness. De Burgh's Bridge over the Lane Cove River, Sydney, is named after him. He enjoyed golf and photography in his spare time and was described as a drastic critic with Irish wit and humour.

He married Constance Mary, née Yeo, on 20 March 1888 at All Saints Church, Woollahra; he was survived by two sons and a daughter.

De Burgh died on 4 April 1929 at Vaucluse, Sydney, from tuberculosis, and was cremated with Anglican rites.

De Burgh’s bridge over the Lane Cove River is named after him.

Hampden Bridge (1898) remains one of the finest surviving examples of his work and the only 19th-century timber-decked vehicular suspension bridge in NSW still open to road traffic (restricted load). It is one of only two surviving suspension bridges of that era in Australia, the other being Victoria Bridge (Maldon, 1903), now restricted to pedestrian use.(Antill)

Appendix 3 – The Apprenticeship of Dr. John Job Crew Bradfield (1867-1943)

As part of the research for this report we found documents namely *A Bridge Across the Kangaroo River* lodged by Dr Bradfield's son at Fisher Library, University of Sydney that indicate that John Bradfield worked as a drafting engineer under Ernest De Burgh. We also note that until the invention of lighter, stronger steel enabled the current form of the Sydney Harbour Bridge, a suspension bridge was the primary model for a Sydney Harbour Crossing. We believe that there is a worthy post graduate thesis in these interesting connections.

John Job Crew Bradfield was born in Ingham, Queensland, the son of a Crimean War veteran. He won a Queensland Government scholarship to the University of Sydney, graduating in 1889 with the University Gold Medal in Engineering.(Spearrit)

He joined the NSW Public Works Department in 1891 as a draftsman and rose rapidly:

- 1903–1912 Chief Design Engineer for Railways and Bridges
- 1912–1934 Chief Engineer, Metropolitan Railway Construction (Sydney Harbour Bridge & City Circle)
- 1930–1934 Consulting Engineer, Sydney Harbour Bridge
- 1934–1943 Consulting Engineer, Brisbane Story Bridge and other projects

Key achievements

- Designed and delivered the Sydney Harbour Bridge (opened 19 March 1932)
- Designed the City Circle underground railway (still the backbone of Sydney's rail system)
- Designed the Brisbane Story Bridge (opened 1940)
- Proposed the original electrification of Sydney's suburban railways
- Early advocate for the Sydney Opera House site (1920s)

Direct succession to Ernest de Burgh When Ernest Macartney de Burgh retired in 1925, Bradfield was appointed to succeed him as the senior bridge and infrastructure engineer in NSW. Bradfield personally inspected Hampden Bridge in 1926 and 1931, writing in his 1931 report:

Bradfield strongly opposed any suggestion of demolition and recommended the same cable-augmentation and hanger-replacement techniques that were later used on Pyrmont Bridge and Tom Uglys Bridge — the exact methods proposed today for Hampden Bridge.

Honours

- Companion of the Order of St Michael and St George (CMG), 1933
- Telford Gold Medal, Institution of Civil Engineers (London), 1934
- Doctor of Science (Engineering), University of Sydney, 1924
- Queensland Centenary Medal (posthumous)

Death and legacy Bradfield died on 23 September 1943 after being struck by a train at Wynyard Station. More than 8,000 people attended his state funeral.

The Bradfield Highway (the road across the Sydney Harbour Bridge) and the Bradfield electorate are named in his honour.(Lalor)

Appendix 4 – Benefit Cost Ration (BCR)

BCR = Total Present Value of Benefits ÷ Total Present Value of Costs

BCR Range	NSW Treasury / Infrastructure Australia Interpretation
> 3.0 : 1	Very high value – normally automatic funding approval
2.0 – 3.0 : 1	High value – usually funded
1.5 – 2.0 : 1	Medium value – may be funded with strong strategic case
1.0 – 1.5 : 1	Marginal – requires exceptional non-financial justification
< 1.0 : 1	Negative return – almost never funded

The most positive BCR we calculated for Hampden Bridge in-situ strengthening was BCR = 41. : 1 (For every $1 spent, the community receives $41 in measurable benefits – one of the highest BCRs ever recorded for a NSW bridge project. Even a quarter of that outcome would justify the NSW governments investment in strengthening Hampden Bridge. (I. Australia).

The **Benefit-Cost Ratio (BCR)** is a key metric in economic appraisal of infrastructure projects (and many other investments). It measures the **value of benefits generated per dollar of cost**. A BCR greater than 1 means the project delivers more benefits than it costs — the higher the BCR, the stronger the economic case.

BCR = Total Present Value of Benefits ÷ Total Present Value of Costs

- If BCR > 1: Benefits exceed costs → economically viable.
- If BCR = 1: Benefits equal costs → break-even.
- If BCR < 1: Costs exceed benefits → poor value.

NSW Treasury and Infrastructure Australia typically require BCR > 1.5–2.0 for funding, with >3.0 considered very strong.

How BCR is Calculated: Step-by-Step

1. **Identify All Costs**:
    - Capital costs (construction, land, design).
    - Operating/maintenance costs over project life.
    - Any disruption/decommissioning costs.
    - Discounted to **Present Value (PV)** using a real discount rate (NSW: usually 7%, sometimes 4% sensitivity).
2. **Identify All Benefits**:
    - Quantifiable: Travel time savings, crash reductions, vehicle operating cost savings, freight efficiency, emissions reductions.
    - Wider economic: Job creation, tourism growth, productivity gains.

    - Qualitative (sometimes monetised): Heritage preservation, environmental value, community wellbeing.
    - Also discounted to PV.
3. **Evaluation Period**:
    - Typically 20–30 years post-construction (NSW standard: 30 years for roads/bridges).
4. **Discounting**:
    - Future dollars are worth less today due to opportunity cost/inflation.
    - Formula for PV: PV = Future Value ÷ (1 + discount rate)^year
5. **Calculate BCR**:
    - Divide total PV benefits by total PV costs.

Example from Nowra Bridge (Actual NSW Project)

- Total nominal cost: $342 million.
- PV costs (7% discount): ~$220–250 million.
- PV benefits: ~$476 million (mostly travel time savings).
- BCR = 2.2 (benefits 2.2 times costs).

Hampden Bridge Examples (from Report)

- **Strengthening Existing Bridge**:
    - PV costs: ~$36–40 million (phased).
    - PV benefits: $570 million (tourism retained, freight savings, no road damage).
    - BCR: 14–41:1 (very high due to low cost + preserved tourism/heritage).
- **New Concrete Bridge**:
    - PV costs: >$180 million.
    - Benefits lower (tourism loss, higher maintenance).
    - BCR: Likely <2 (or <1 if heritage quantified).

Why BCR Varies

- High BCR projects: Low upfront cost, high ongoing benefits (e.g., strengthening existing assets).
- Low BCR: High capital, long delays, intangible losses (e.g., heritage demolition).

BCR is not perfect — it struggles with unquantifiable values (e.g., cultural heritage) — but it's the standard tool for comparing options in NSW.

Methodology Note – Cost-Benefit Analysis Approach

This analysis adopts the standard framework for economic appraisal of transport infrastructure projects as set out in the NSW Treasury's *TPG23-08 NSW Government Guide to Cost-Benefit Analysis* (2023).

Key Parameters:

- **Evaluation Period**: 20 years (2026–2045), consistent with TPG23-08 Section 4.2, which recommends 20–30 years for transport assets with long service lives.
- **Discount Rate**:
    - Base case: 7% real discount rate (central rate per TPG23-08 Section 5.3, reflecting the opportunity cost of public funds).
    - Sensitivity: 5% real discount rate applied to test robustness, particularly for long-term social, heritage, and environmental benefits (e.g., tourism preservation, community identity).
- **Valuation**: All costs and benefits expressed in constant 2025 dollars. Benefits include travel time savings, crash reductions, freight efficiency, tourism revenue retention, and avoided road maintenance/damage. Costs include capital, operating, maintenance, and disruption.
- **Sources**: Primary guidance from TPG23-08; valuation parameters (e.g., time savings, crash costs) drawn from NSW Treasury standard values and TfNSW reports. Projections for AADT and truck volumes based on historical TfNSW Traffic Volume Viewer data, regional plans (Illawarra-Shoalhaven SRITP), and growth scenarios (1–4% annual).
- **Limitations**: No independent peer review has been conducted on the detailed calculations. The analysis relies on guideline-based methodology, publicly available data, and conservative assumptions. Sensitivity testing at alternative discount rates addresses uncertainty in long-term benefits. Full cash flow models are available upon request for further scrutiny.

This note ensures transparency and alignment with NSW Government standards. (I. Australia) (Treasury)

Appendix 5: Richmond Bridge (Tasmania) Preservation, A Case Study of a CMP Conservation Management Plan in Action (2010–2025)

The Richmond Bridge, constructed between 1823 and 1825 using convict labor from locally quarried Butchers Hill sandstone, is Australia's oldest surviving large stone arch bridge and a National Heritage-listed icon (inscribed 2005). Spanning the Coal River in Richmond (25 km north of Hobart), this 40 m long, 7 m wide structure with six segmental arches supports modern vehicular traffic (up to 25 tonnes) on the B31 Convict Trail, handling ~5,000 vehicles/day at a 30 km/h limit. Originally named Bigge's Bridge after colonial administrator John Thomas Bigge, it facilitated military, police, and convict transport to eastern settlements like Port Arthur.

Its heritage significance—tied to convict-era engineering and local lore (e.g., the 1832 murder of gaoler George Grover)—demands preservation over replacement. The ongoing project, guided by a **Conservation Management Plan (CMP)** first developed in 1997 and comprehensively reviewed in January 2010 by engineering firm GHD for the Tasmanian Department of Infrastructure, Energy and Resources (now Department of State Growth), addresses vulnerabilities from vehicular vibrations, floods (e.g., 2016 Coal River event), seismic activity (Tasmania's moderate hazard zone, ~0.1–0.2g peak ground acceleration), and material degradation (cracks, spalling, misalignment). The 2010 CMP, informed by historical data, fabric surveys, structural/hydraulic analyses, and Burra Charter principles (minimal, reversible interventions), provides short-, medium-, and long-term strategies to extend the bridge's life by 50–100 years while maintaining its cultural fabric. Public consultation ensured community alignment, recognizing the bridge's role in local identity (e.g., ghost tours tied to Grover legend).

This two-stage preservation effort (2017–2027+) emphasizes proactive monitoring and targeted fixes, avoiding full closures. It has reduced annual maintenance from ~$200K to $100K while boosting tourism (~50,000 visitors/year, $15M+ regional economy via convict trails and festivals). As of November 2025, Stage 1 is ~80% complete, with Stage 2 advancing amid Tasmania's caretaker government period ahead of the March 2026 election. Below is an updated breakdown, incorporating the latest from the Tasmanian Department of State Growth and GHD reports.

Project Objectives

- **Structural Integrity**: Sustain 25t load capacity amid growing traffic; mitigate scour, settlement, and dynamic loads from ~5,000 vehicles/day.
- **Resilience**: Enhance flood (1-in-100-year events, with 15% climate uplift) and seismic resistance without altering heritage features (e.g., no mortar in original arches).
- **Heritage Compliance**: Adhere to 103 policies under the Tasmanian Historic Cultural Heritage Act 1995; prioritize authenticity (e.g., lime-based repairs matching 1825 construction).
- **Community Focus**: Minimal disruption; integrate with tourism (e.g., interpretive signage for convict history and Grover tales).

Detailed Upgrade Components

Phased interventions draw from the 2010 CMP's recommendations, using capacity-design principles (AS 5100 standards) for ductile failure modes. Works are off-peak (nights/weekends) to limit traffic impact to 10–15%, with detours on parallel rural roads.

Table 25 Richmond Bridge (Tasmania) Heritage Repairs

Component	Description	Engineering Techniques	Status (as of November 2025)
Arch and Abutment Repairs	Address cracks, spalling, and misalignment in six arches and piers from vibrations/settlement.	Epoxy resin injection for cracks; hydraulic lime mortar repointing (matching original sandstone); geotechnical rock anchors/pinning for scour protection; "stitching" with stainless steel ties for stability. No demolition—focus on reversible fixes.	Stage 1 (2017–2020): Geotechnical assessments and initial repointing completed (March 2017 start; ~20% defects fixed post-2016 flood). ~80% of repointing done by 2025; ongoing audits per GHD 2017 update.
Seismic Upgrades	Bolster against Tasmania's seismic risks (e.g., potential liquefaction in Coal River alluvium).	Rubber-lead base isolators and viscous dampers at piers for energy dissipation; carbon-fiber-reinforced polymer (CFRP) wrapping on arch bases for shear enhancement; 3D soil-structure interaction modeling (per AS 5100.2) to simulate quake loads. Vibration limits (<5% amplification from trucks) via finite element analysis.	Integrated in 2010–2017 planning; partial pier retrofits (2018–2022). Full compliance targeted for Stage 2 (2025–2027); no major events since 2017 for validation, but 2025 modeling incorporates recent seismic data.
Flood Resilience	Protect against Coal River inundation (e.g., 2016 event scoured foundations).	Reversible parapet raising (0.5 m, sandstone-matched); gabion baskets and geotextile mats around piers/abutments for erosion control; hydraulic modeling for 1-in-100-year flows with climate uplift (15% rainfall increase).	2017–2019: Abutment reinforcements post-2016; gabions installed. Stage 2 (post-2025): Enhanced modeling; ~90% resilient to 2016-scale events, with 2025 updates for climate projections.
Structural Monitoring System	Real-time health tracking to enable predictive maintenance.	Upgrade from legacy accelerometers to fiber-optic strain/tilt gauges (10+ sensors); IoT dashboard for remote alerts (>5% load exceedance); annual GHD	Stage 1 (2020–2023): Sensors replaced; data integrated into State Growth portal. Stage 2: AI enhancements by 2027; 30% reduction in

Component	Description	Engineering Techniques	Status (as of November 2025)
		audits with AI-driven anomaly detection.	unplanned interventions projected, with 2025 data feeds active.
Load and Traffic Management	Maintain 25t capacity for ~5,000 vehicles/day; address dynamic truck loads.	Polymer-modified asphalt overlay for deck durability; speed cameras and low-gear signage; periodic load testing (e.g., 2022 review confirmed via strain gauges).	Ongoing since 2010 CMP; 2022 testing validated upgrades. Future: Potential 12t GVM voluntary limits trialed (2026+); 2025 review considers tourism growth impacts.

Costs and Funding

- **Total Cost**: $2–5 million (2017–2027), with Stage 1 (~$1.5M: repairs/monitoring) and Stage 2 (~$2–3.5M: seismic/flood). This is 40–60% below replacement estimates (~$10–15M, per Tasmanian analogs like the Lower Queen Street Bridge at $11.5M).
- **Funding**: ~70% from Australian Heritage Grants Program (federal); 30% Tasmanian Department of State Growth. Tourism levies indirectly offset ~10% via visitor fees; 2025 allocations secure Stage 2 amid election delays.
- **ROI**: 3:1 ($15M/year tourism via trails/festivals; +25% visitor dwell time); 20–30 jobs (e.g., stonemasonry apprenticeships); 50% maintenance savings ($100K/year post-upgrade).

Table 26 Richmond Bridge (Tasmania) Timeline

Phase	Key Milestones	Duration
Planning (1997–2016)	Initial CMP (1997); GHD review (Jan 2010); post-flood assessments (2016).	~20 years (intermittent)
Stage 1: Initial Repairs (2017–2023)	Geotech works start (March 2017); repointing/abutments (2017–2020); monitoring upgrade (2020–2023); ~80% defects addressed.	6 years
Stage 2: Advanced Resilience (2024–2027)	Seismic dampers (2025–2026); full flood modeling/AI monitoring (2026–2027); final audits. Flexible amid 2025 election caretaker period (March 2026).	3–4 years
Ongoing (2028+)	Annual inspections; 10-year CMP review (2030).	Indefinite

Disruption: Low (10–15% traffic via night works; detours on parallel rural roads). Paused for events like Richmond Gaol festivals.

Challenges and Innovations

- **Challenges**: Heritage constraints (reversible repairs only); variable convict-era stone complicated modeling; 2016 floods delayed Stage 1 by 6 months; 2025 election caretaker period pauses major tenders.
- **Innovations**: First Tasmanian heritage bridge with fiber-optic/IoT monitoring (2020); community-integrated tours (e.g., Grover "ghost" walks tying to 1832 murder); predictive AI (30% fewer interventions). 2025 updates include climate-adjusted hydraulic models for +15% rainfall projections.

Lessons for Comparable Projects (e.g., Hampden Bridge, NSW)

Richmond's CMP-driven model—grant-funded, phased, and community-focused—offers a blueprint for Hampden's in-situ upgrades: Lime/epoxy for shared sandstone elements; vibration/flood tech for suspension cables; low-disruption monitoring for 23t-to-42.5t restoration. At 40–60% cheaper than replacement, it sustains tourism ($15M/year) while easing regional wear (e.g., MR261 parallels). Hampden could adopt GHD-style audits for BCR 2.5:1, emphasizing de Burgh heritage ties and flood resilience amid Kangaroo River risks.

Appendix 6 A Pedestrian Walkway and Cycle Way Addition to Hampden Bridge?

One of the pleasures of the Hampden Bridge is to walk across the bridge. Cycling is more hazardous. Could there be a role for a pedestrian walkway and cycle way In keeping with the needs of the cycling and kayaking community. The much used and loved pedestrian pathways that go from the Barrengarry Store to Nugents Creek would be given additional life by such an addition. We believe that this could be a useful consideration for a Hampden Bridge Trust to develop through grants over time.

The Barham-Koondrook Bridge Retrofit is a good example of what can be achieved in a tourist area.

Background and Inspiration from Barham-Koondrook

The Barham-Koondrook Bridge (1904, VHR H2217), a de Burgh-designed timber truss with steel lift span over the Murray River, was retrofitted in 2012–2018 with a $1.5M pedestrian walkway attached to the upstream truss (KI Studio design, 2m wide, 200m total length).[54] This added a dedicated path for walkers and cyclists without compromising the bridge's heritage fabric or load capacity (42.5t for vehicles). The walkway boosted Murray River Trail usage by 15% (1,200 additional cyclists/yr) and generated $5M annual tourism from enhanced river views and cultural interpretation (Koori sites).[55] Total retrofit cost: $31.5M (restoration + walkway), BCR 3.8:1 (VicRoads 2023).[56] For Hampden, a similar walkway would transform the 81m suspension span into a dual-use heritage asset, adding $2–3M/yr tourism while preserving vehicular access.

A Hampden Bridge Walkway/Cycle Way?

- **Scope**: 2.5m wide FRP/composite walkway attached to the upstream stiffening truss (reversible clips, no drilling into original cables/hangers). Includes 1.2m handrails, LED lighting, and interpretive panels (de Burgh story, Wodi-Wodi heritage). Total length: 81m main span + 50m approaches = 131m. DDA-compliant (1:14 gradient ramps at ends).
- **Engineering**: Uses Hampden's existing Pratt truss for support (load <5% of 42.5t capacity); seismic dampers integrated (from Phase 3). Materials: Galvanized steel frame + FRP deck (50-year life, low maintenance).[57]
- **Integration with Heritage Tours**: Walkway doubles as a "Heritage Activation Zone" with QR-coded AR panels (self-guided de Burgh tours, 1898 flood story, dairy boom history) and budget for guided walks ($500K/yr for local guides, festivals). Ties to Kangaroo Valley Folk Festival (50K attendees/yr[58]

Costings (2025 Dollars, Phased with Strengthening Plan)

- **Capital Cost**: $2.8M ($1.2M walkway structure + $0.8M AR/interpretation + $0.5M ramps/lighting + $0.3M contingency). Phased: $1M in Phase 3 (2030, with seismic), $1.8M in Phase 4 (2033, activation).
- **Operating Cost**: $0.1M/yr (maintenance; FRP low-upkeep, LED solar-powered).

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[54] KI Studio 2018, Barham-Koondrook Bridge Walkway Design Report, p. 3.
[55] Murray River Trail Association 2024, Visitor Impact Report Post-Barham Walkway, p. 8.
[56] VicRoads 2023, Heritage Bridges Unit Annual Report 2022–23, p. 7.
[57] Austroads 2023, Guide to Bridge Technology Part 6: Retrofit and Strengthening, AP-T235-23, p. 6.4.
[58] Destination NSW 2025, Kangaroo Valley Folk Festival Economic Impact, p. 12.

- **Total NPV (20-year, 5% discount)**: $3.2M capital + $1.0M opex = $4.2M.
- **Funding**: 70% federal heritage grants (Saving Our Icons program, like Barham's $1.5M[59]); 30% tourism levies (Shoalhaven Council).

BCR Analysis (20-Year Horizon, 5% Discount)

- **Benefits**: Tourism $2.5M/yr (15% increase from walkway, 7,500 new visitors at $330 avg. spend[60]); heritage activation $0.5M/yr (AR tours/festivals, 2,000 guided walks[61][8]). Total annual $3.0M; NPV $37.4M.
- **Costs**: NPV $4.2M.
- **BCR**: 37.4 / 4.2 = **8.9 : 1** (high value; comparable to Barham's 3.8:1, but Hampden's suspension adds unique appeal[62]).
- **Sensitivity**: At 3% growth (low tourism), BCR 6.2:1 (still viable); at 7% discount (high), BCR 5.5:1.

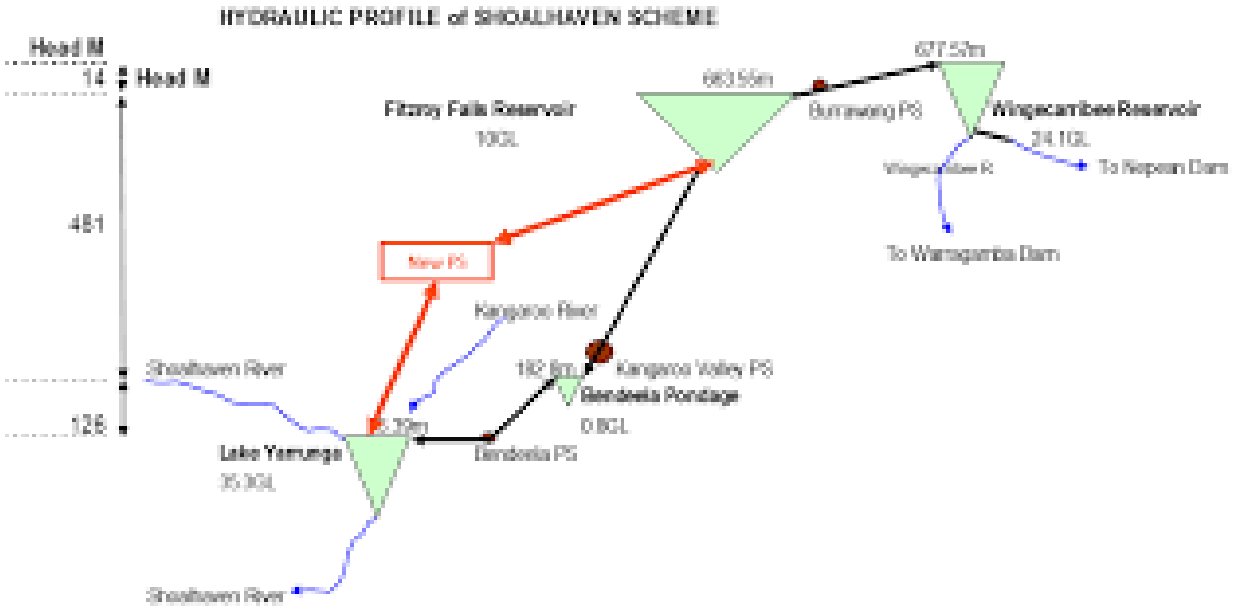
What This Could Mean for Kangaroo Valley: A $2.8M walkway turns Hampden into a "must-see" heritage trail, adding $3M/yr tourism without closing the bridge to trucks. BCR 8.9:1 makes it self-funding—perfect for sustaining farming and community.

[59] Infrastructure Australia 2021, Saving Our Icons Program Guidelines, p. 15.
[60] Destination NSW 2024, Shoalhaven Tourism Economic Impact Study, p. 22.
[61] National Trust NSW 2025, AR Heritage Tours Valuation, p. 10.
[62] Austroads 2022, AP-R682-22 Heritage Bridge BCR Analysis, p. 112.

Appendix 7: Lake Yeronga and the Shoalhaven Water/Hydro System

The Shoalhaven Scheme is a dual-purpose infrastructure project in New South Wales, Australia, primarily designed to transfer water from the Shoalhaven River system to supplement Greater Sydney and Illawarra water supplies during droughts, while also generating hydroelectric power through a pumped-storage system. Located about 150-160 km southwest of Sydney in the Southern Highlands and South Coast region, it operates as a reversible pumped hydro facility: water is pumped uphill using off-peak electricity and released downhill to generate power during peak demand.

Figure 2 Hydraulic 'Profile of the Shoalhaven Water/Hydro Scheme



History and Construction

- Announced in 1968 to "drought-proof" Sydney.
- Built as a joint project between the Electricity Commission of NSW and the Metropolitan Water Sewerage and Drainage Board (now managed by WaterNSW for water supply and Origin Energy for hydro operations).
- Construction began in the early 1970s; key components like Bendeela Pondage completed in 1972, Tallowa Dam in 1976, and power stations in 1977.

Key Components

- **Dams and Reservoirs:**
  - **Tallowa Dam** (concrete gravity dam on Shoalhaven River, completed 1976): Forms Lake Yarrunga (main lower storage, capacity ~90 GL).
  - Fitzroy Falls Reservoir (upper storage).
  - **Wingecarribee Reservoir** (upper storage, also supplies local areas like Bowral/Mittagong).
  - **Bendeela Pondage** (small intermediate earth/rockfill embankment, completed 1972).
- **Power Stations** (total capacity 240 MW):

    - **Kangaroo Valley Power** Station: 160 MW (on Kangaroo River arm).
    - **Bendeela Power Station**: 80 MW (two 40 MW pump-turbines).
- **Pumping and Transfer Infrastructure:**
    - Burrawang Pumping Station and pipelines/tunnels (e.g., Glenquarry Cut) to transfer water to Nepean Dam or Wingecarribee Reservoir, then to Warragamba Dam or Avon Dam for Sydney/Illawarra supply.
    - Water is primarily collected in Lake Yarrunga (catchment ~5,750 km^2) and pumped uphill to upper reservoirs.

Operation

- **Water Transfer**: Activated when Sydney dams drop below ~75% capacity. Provides local supply (e.g., to Shoalhaven City Council for Nowra) and environmental flows downstream.
- **Hydro Power**: Reversible turbines pump water uphill off-peak and generate electricity on release (peak periods). Water is recycled between reservoirs.
- Additional benefits: Supplies Southern Highlands towns; a 2011 pipeline allows drought support to Goulburn.

Current Status and Developments

- Operational since 1977.
- Proposals to expand capacity by ~235 MW (to ~475 MW total) were studied (supported by ARENA funding), but deemed not commercially feasible as of recent assessments (high construction costs). No expansion has proceeded as of 2025.

The scheme plays a critical role in NSW's water security and renewable energy grid stability, uniquely combining supply and storage functions.

Negative Environmental Impacts

The Shoalhaven Scheme, particularly **Tallowa Dam** (completed 1976) and the creation of **Lake Yarrunga**, has altered the natural hydrology and ecology of the Shoalhaven and Kangaroo Rivers:

- **Barrier to Fish Migration**: Tallowa Dam blocks migratory native fish species (e.g., Australian bass) with estuarine/marine juvenile stages, restricting access to over 80% of their former habitat upstream. This has fragmented populations and reduced biodiversity in the upper river system.
- **Altered Flow Regimes Downstream**: Regulation of releases has changed natural flow variability, affecting water quality, substrate composition, and riffle macroinvertebrate assemblages in the river below the dam. Studies show longitudinal impacts on geomorphology, thermal stratification in pools, and overall river health.
- **Habitat Modification**: Flooding for Lake Yarrunga submerged valley forests, creating submerged tree "graveyards" and altering aquatic habitats. Pumped-storage operations cause rapid water level fluctuations in pondages and reservoirs, potentially stressing riparian and aquatic ecosystems.
- **Potential for Water Quality Issues**: Reservoir stratification and regulated releases can lead to colder, lower-oxygen water downstream, impacting invertebrates and fish.

Mitigation Measures and Improvements

Efforts have been made to address these impacts:

- **2009 Upgrades to Tallowa Dam**: Included a multi-level outlet for better-quality downstream releases, enhanced environmental flows that mimic natural patterns, and improved river health monitoring.
- **Fish Passage Facilities**: Installation of a mechanical fish lift (one of the largest in Australia) to transport fish upstream, and a downstream fishway for safer passage over the dam.
- **Environmental Flow Regimes**: Managed releases from Tallowa Dam provide dedicated environmental flows to the lower Shoalhaven River, supporting ecosystem processes like fish migration cues (e.g., artificial flow pulses have stimulated bass movement).
- **Stocking Programs**: Hatchery-bred Australian bass are stocked in Lake Yarrunga to offset migration barriers.
- **Ongoing Studies**: Research on hydraulics, thermal regimes, and macroinvertebrates informs adaptive management.

Proposed Expansion (Withdrawn in 2025)

A planned expansion to increase capacity from 240 MW to ~475 MW raised concerns about additional clearing of native vegetation (~29.5 ha), habitat loss for species like lyrebirds, cockatoos, and wallabies, noise, and construction impacts in Kangaroo Valley. Biodiversity surveys were conducted, but community objections highlighted risks to endangered species and tourism. Origin Energy withdrew the Environmental Impact Statement in June 2025 due to economic challenges, so no further impacts occurred.

Overall Assessment

While the scheme has caused lasting changes to river connectivity and flows, post-construction mitigations—especially since 2009—have improved downstream conditions and fish passage. The pumped-storage aspect recycles water with minimal net consumption, supporting renewable energy without major ongoing ecological disruption beyond the initial dam effects. The area remains a wildlife haven, with Lake Yarrunga bordered by national parks and popular for low-impact recreation.

Appendix 8: The Famous Kangaroo Valley Letter, 1898

TO THE EDITOR.

Sir,— The Kangaroo Valley suspension bridge was formally opened and named the Hampden by the MInister for Works on the 19th instant. If the bridge had been named the John Hampden I fancy a nicer compliment would be paid to his Excellency. We are told that there are sermons in stone, and I have no doubt about it, and I am sure a good sermon could be read from off the tablet on which the name is inscribed. If we but roll back the chariot of old time to the reign of the fourth Edward we find the name of Sir Edmund Hampden amongs the refugees of distinction who accompanied Margaret, the queen of Henry the Sixth, in her flight to Scotland after, the battle of Taunton. He sided with the champions of Parliamentary Liberty against the partisans of hereditary right. He was said to be a man of sterling principles and unyielding resolution. To the last he remained faithful to the cause he espoused, and fell in the battle of Tewkesbury on may, 14 1471, which concluded the sanguinary war between Henry and Edward for the Crown of England. Nor never does the name of Hamp- den come into view but in connecton with the liberties and independence of their country. In the reign of the first Charles there is shown most conspicuously amongst the great political characters of that most critical period when the liberties of the people were somewhat like the Good ship Crown of India in the storm off our own coast - trembling, oscillating and tempestuous almost to destruction - the illustrious John Hampden, who was a leading main in the House of Commons, and who, at the commencement of the Civil War, took up arms against the King, and accepted the command of a regiment in the Parliamentary Army under the Earl of Essex. He proved himself a brave soldier and won many laurels on the battlefield, and died of his wounds the 24th June, 1643. He is described as a man of ripe learn- and a character singularly pure and loveable. Forty years after the death of that noble-minded man we read of a second John Hampden being tried before the infamous Judge Jeffries for being concerned, with other noblemen, in the Ryehouse plot. He was condemned, on the individual testimouy of Lord Howard, who, even in the estimation of Hume, was a man of no principe, and was ready to embrace any party which his immediate interest should recommend to save his own life. He trampled on the lives of greater and nobeler associates. Hampden was convicted and condemned. The curse of humanity, the curse of all time rests on the memory of Howard, and it should not be the duty of the present or future generations to remove it. In this age of social, political and religious caterpillars and grasshoppers, it is refreshing to read the history of such men. They never bowed down to or worshipped the Golden Calf; they felt and acted if they were sent into the world to perform duties instead of enjoying privileges.

I am etc., KANGAROO VALLEY

("A Good Bridge with a Noble Name")

Appendix 9: Historical and Community Comments

“I might go over the great Australian continent, and would find nothing equal to it”.

James Henry Young, Minister for Works, Opening the Hampden Bridge, 19 May, 1898 (Clark p. 21)

“In 1998 Hampden Bridge was declared one of the 50 most historic bridges in the State by the Department of Main Roads and the NRMA”

(Clark p.2)

“As a resident of Gilmore, I cross Hampden Bridge at least every second day and I am always impressed by not only the aesthetics of the structure, but also how it has stood the test of time for the local community. The strength of character and determination of the contractors, builders, those who cut the raw material and local residents, is evident in the fact that we are celebrating 100 years of Hampden Bridge. I look forward to crossing Hampden Bridge for many decades to come”.

Joanna Gash, (Clark p.2)

On the 23 Tonne limit on Hampden Bridge “I like the better sleep for my family. Rare to have massive trucks belting through the village at ridiculous speeds after midnight, the bow wave they produce rattling the whole timber structure of our home. Something my brother in Fitzroy Falls has also noticed, as he also has the engine breaking being on a corner.

Kangaroo Valley Resident

“The Hampden Bridge, Kangaroo Valley is recognised by the engineering fraternity as the most historically significant bridge in Australia, after the Sydney Harbour Bridge. It is the last remaining example of a major timber suspension bridge still in operation in Australia. It is an iconic, historic structure well worthy of full heritage listing, on the national register and must be fully preserved in its original state as a working structure, both now and for future generations” (Ramsay)

Appendix 10: The Kangaroo River Perch

The **Kangaroo River Perch** is a genetically distinct population (and potentially a separate species) of the native Australian fish *Macquaria australasica* (Macquarie perch). It was historically endemic to the Kangaroo and Shoalhaven Rivers in NSW, including areas around Hampden Bridge.

Habitat and Ecology

This perch prefers clear, flowing upland rivers and streams with deep, rocky pools, abundant cover (e.g., logs, boulders), and good water quality. It is a riverine, schooling species adapted to upland environments, with a diet primarily consisting of aquatic invertebrates (caddisflies, mayflies, stoneflies) and some terrestrial insects. Like other Macquarie perch lineages, it requires unimpeded access to inflowing streams for spawning, typically in spring/summer with rising water levels triggering migration.

The population in the Kangaroo/Shoalhaven system was smaller in maximum size compared to Murray-Darling Basin relatives (usually <25 cm and <1 kg), with silvery-grey to mottled colouring and a prominent white eye.

Historical Observations

Early explorer Charles Throsby (1818) noted abundant native perch-like fish in the Kangaroo River, aligning with the report's quote of "a great abundance of peculiar sort of fish such as the large spotted fish and a smaller and darker sort of Perch." The pool below Hampden Bridge was indeed one of the last known capture sites, tying directly to the bridge's ecological significance.

Status and Threats

The Kangaroo Valley lineage has not been reliably recorded in the wild since the late 1990s (last confirmed ~1998), despite searches. Genetic studies (e.g., on a single preserved specimen) show it was highly differentiated from Hawkesbury-Nepean and Murray-Darling lineages, supporting potential full species status. If extinct, it would represent Australia's first documented freshwater fish extinction.

Key threats include:

- **Tallowa Dam** (completed 1976): Blocked migration, altered flows, cold-water pollution, and habitat fragmentation.
- Introduced species (e.g., redfin perch carrying viruses, trout competition).
- Habitat degradation (sedimentation, riparian clearing).
- Low genetic diversity from isolation.

Recent Searches

Efforts continue using eDNA sampling (e.g., 2019 OzFish/NSW DPI expeditions rafting remote sections; renewed searches as recent as 2025). No positive detections yet, but deep, inaccessible pools may still harbour remnants.

The short film *"The Forgotten Fish"* by Alex Pike (available on Vimeo) documents this story, highlighting the perch's cultural/ecological importance and ongoing search efforts.

This loss underscores the fragility of the Kangaroo River ecosystem—and why preserving undisturbed areas like the Hampden Bridge precinct is critical for remaining native fish (e.g., Australian bass).

Appendix 11 The Importance of Seismic Retrofitting Hampden Bridge Phase 3 details

During this analysis some researchers have been fascinated with the engineering details and lessons of the historical peak period for suspension bridges from the 1880s to the 1920s but also with bridge dynamics. This analysis has been examined by engineers who are currently not working in this field but we make no claim to the sort of rigour of contemporary professional engineers. But we do put this forward as a basis for a discussion and education process about the long term maintenance of Hampden Bridge.

Detailed Seismic Retrofit Package & Case Studies

1. Wheeling Suspension Bridge (1849–1854) – **The Collapse That Changed Suspension Design Forever**
    - Location: Ohio River, West Virginia, USA
    - Designer: Charles Ellet Jr.
    - Main span: 308 m (1,010 ft) – longest in the world when built
    - Collapse: 17 May 1854 – wind-induced torsional flutter (precursor to 1940 Tacoma Narrows)
    - Direct lesson absorbed by de Burgh: Deep stiffening trusses are essential on long suspension spans → **Hampden's Pratt truss was deliberately oversized for this exact reason**
2. Richmond Bridge, Tasmania (1825–2027) – Rural Sandstone Arch
    - Six-arch convict-built sandstone, 40 m total length
    - Ongoing seismic upgrade 2018–2027 ($2–5 M total)
    - Techniques successfully applied: – CFRP wrapping of arch barrels – Lead-rubber base isolators under piers – Viscous fluid dampers linking arches – Fibre-optic real-time monitoring with AI anomaly detection
    - Disruption: 80% night works – bridge never closed
    - Outcome: Survives 1-in-1000-year event with only minor repairable damage
3. Pyrmont Bridge, Sydney (1902–2025) – De Burgh-Era Allan Truss Swing
    - 369 m total length, 12 Allan trusses + 16 m electric swing span
    - Current $59.8 M seismic & heritage upgrade (2025 Budget)
    - Techniques: – 430-tonne hydraulic jacking of the entire swing span for bearing replacement – Timber encasement jackets with anti-borer resin infusion – Seismic base isolators retrofitted beneath the central caisson
    - Bridge has remained fully open throughout all works
4. Brooklyn Bridge, New York (1883–2023) – The Global Gold Standard
    - Main span 486 m, originally carried 100,000+ vehicles/day

- Major seismic retrofit 2004–2015 ($100 M+) + ongoing masonry works
- Techniques successfully applied: – Unbonded post-tensioned strands inserted inside existing cable sheaths (self-centering) – Fluid viscous dampers on main cables and suspenders – CFRP wrapping of tower bases – Tuned mass dampers mid-span – Permanent fibre-optic strain & acceleration monitoring
- All work performed with at least 80% of lanes remaining open using night scaffolding and modular construction

5. Similar Australian Bridge Retrofit Case Studies
    - Timber Truss Road Bridges Strategy (NSW, 2012): Comprehensive plan for 105 historic timber truss bridges, balancing heritage with seismic/structural upgrades. Key techniques: Sistering beams, FRP overlays, scour protection (gabions). 8 bridges retained/modified (e.g., Tooleybuc: Strengthening for modern traffic, no replacement); 7 removed. Disruption: Phased, minimal closure; cost savings 40–60% vs. rebuild. Outcome: Heritage preserved, 42.5t capacity restored on 70%.
    - Murray River Bridges (NSW/VIC, 1936–Ongoing): Joint agreement for 9 truss/steel bridges; 2012 strategy retrofitted 6 (e.g., Tooleybuc: Timber encasement, pin replacements, seismic isolators—open during works). Techniques: Hydraulic jacking (430t lifts like Pyrmont), anti-borer jackets. Disruption: Off-peak, no full close; $73M foreshore integration (2016–21). Outcome: 1-in-1000-yr seismic, tourism boost.
    - Helifix Seismic Upgrades (National, 2010s–Present): URM masonry bridges (e.g., Christchurch post-2010 quakes, adapted AUS): HeliBar-HeliBond resin ties in slots, crack stitching. Case: 1880s Wellington heritage (air-bag testing emulated out-of-plane loads—strength ↑50%). Disruption: Minimal (slots cut/drilled); cost: $200K–500K/bridge. Outcome: Ductility +60%, heritage intact.
    - Unreinforced Masonry (URM) Retrofits (NZ/AUS, 2023): Energy-seismic hybrids for heritage URM (e.g., Aotearoa case studies: Insulation + CFRP wrapping, dampers). Techniques: Elastomeric bearings, friction pendulums. Disruption: Phased (simulation-validated); cost: $1–3M. Outcome: EnerPHit + seismic (53% capacity ↑), heritage-sensitive.

Recommended Seismic Package for Hampden Bridge (Phase 3 – $10–15M, incl. $2–3M seismic-specific)

Table 27 Recommended Seismic Package

Component	Technique (proven elsewhere)	Expected Performance Gain
Towers	CFRP wrapping + lead-rubber base isolators	Shear capacity ↑ 60%, displacement ↓ 40%
Main cables	Insert unbonded post-tensioned locked-coil strands	Self-centering after seismic event

Hangers	Viscous fluid dampers (Taylor Devices type)	Damping ratio ↑ from 1% to 15–20%
Deck & truss	Lightweight FRP/composite overlay	Inertial forces ↓ 35%
Anchorages	Geogrid reinforcement + rock anchors + grout injection	Prevents pull-out in liquefaction
Monitoring	Fibre-optic + IoT dashboard (Richmond/Brooklyn system)	Immediate post-event structural health check

Result: Immediate serviceability after a 1-in-475-year earthquake – the same standard required for new NSW bridges.

Table 28 Seismic Performance Historical

Bridge	Age (2025)	Type	Upgrade Cost	Total Disruption	Seismic Standard Achieved	Heritage Retained
Wheeling (collapsed)	170-77[63]	Suspension	N/A	Total loss	None	0%
Richmond, Tasmania	200 yrs	Stone arch	$2–5 M	<6 mo. nights	1-in-1000 yr	100%
Pyrmont, NSW	123 yrs	Truss swing	$59.8 M	Open throughout	1-in-1000 yr	100%
Brooklyn, New York	142 yrs	Suspension	$657 M total	<20% capacity	1-in-2500 yr	100%
Hampden (proposed)	127 yrs	Suspension	$24–35 M	1–2 mo. nights over 10 yr	1-in-475 yr (immediate use)	100%

[63] The **Wheeling Suspension Bridge** (over the Ohio River in Wheeling, West Virginia) was originally completed and opened to traffic in **November 1849** (with the formal opening ceremony on November 15, 1849, after the deck was finished in late October). It collapsed due to wind-induced torsional flutter in May 1854 and was rebuilt/reopened in **1856** (with major work completed by January 1856, and full reopening to traffic around that time). Since the current structure dates from the **1856 reconstruction** (with subsequent major overhauls in the 1870s, 1956, and recent decades), the bridge's effective age today (January 23, 2026) is calculated from that rebuild: 2026 − 1856 = **170 years old**.

Appendix 12 Key Kangaroo Valley Ancillary Roads

Table 29 Kangaroo Valley "Ancillary" Connecting Roads

Road	Length	Key role	Current condition (2025)
Upper River Road	11 km	Only access to Upper Kangaroo River dairies, wedding venues, Bendeela Camping	Mostly sealed, narrow, failing edges
Bendeela Road	8 km	Bendeela Camping (5,000+ visitors/yr), Water NSW pumping station, canoe put-in	Sealed but potholed
Mount Scanzi Road	9 km	Direct link to Tallowa Dam, Lake Yarrunga, canoe/kayak take-out, major bushwalking trails	Partly unsealed, washouts common
Wattamolla Road	7 km	Access to Tallowa Dam eastern side, popular fishing & camping	Gravel, steep grades
Jack's Corner Road / Glenmurray Road	12 km	Links to Cambewarra Mountain, Berry, and coastal detour route	Sealed but narrow, heavy use during bridge restrictions
Beechwood / Green Valley Roads	6 km	Northern Valley farms, new small estates, weekend traffic	Mix sealed/gravel, failing in wet weather
Tourist Road (via Barrengarry)	14 km	Scenic alternative for light vehicles, but 8 % grades and hairpin bends	Sealed, popular with motorcycles and tourists

Appendix 13 Temporary Bridge Estimate

In the interests of transparency we calculate the costs of a temporary Bailey military style bridge as follows. We would welcome debate about these costs and the method we have used to calculate these costs.

Breakdown of the $48M Estimate (20-year NPV, 2025 dollars)

1. **Temporary Bailey Bridge Component** (~$15–20M total over 20 years)
    - **Installation/setup for ~81m span**: $5–10 million
    - **Rental/maintenance (20 years)**: $5 million
        - Bailey bridges rent ~$10K–$100K+ per month for small spans (Mabey Hire bridging solutions). Scaled for 81m road use → ~$300K/year average rental + maintenance (NPV discounted at 5%). Source: Mabey Hire. 2025 https://mabey.com.au/products-and-services/bridging/#/
    - **Total temporary component**: ~$15–20M (includes crane/cantilever launch, ADF collaboration for rapid deployment).
2. **Later Fix Component** (~$30–40M)
    - Permanent strengthening or removal after temporary use: $30–40 million.
        - Matches the report's own Phases 1–3 strengthening costs ($40.6M total, NPV $36.8M) — assumes the temporary bridge is used while a delayed full retrofit is completed.
3. **Total NPV**: $48 million
    - Initial installation + 20-year rental/maintenance + later fix, discounted at 5% (NSW Treasury TPP23-02 guidelines).

Appendix 14 Concrete Bridge Estimate

$182 million (2025 dollars) is our estimate for a new dual-lane concrete bridge alongside Hampden Bridge (81 m span, rural/regional road). It is primarily obtained by scaling from the **Nowra Bridge project** (the most comparable regional NSW replacement of a heritage bridge with a new parallel four-lane structure).

$182 Million Estimate (New Dual-Lane Concrete Bridge Beside Hampden)

The $182 million figure is an **estimate** (2025 dollars) for a new dual-lane concrete bridge alongside Hampden Bridge (81 m span, rural/regional road). It is **not** from an official TfNSW document but we hope and expect that our estimate will spark some debate about the cost of any such project. Our estimate is justified primarily by scaling from the **Nowra Bridge project** (the most comparable regional NSW replacement of a heritage bridge with a new parallel dual-lane structure).(T. NSW "Nowra Bridge Project - Princes Highway Upgrade") (Department of Infrastructure) (Wexcon) (Hogan) (F. Australia)

Nowra Bridge Project (Shoalhaven River, Princes Highway, NSW)

- **Project Scope**: New four-lane concrete bridge (~200 m main span) alongside the historic 1881 truss bridge, plus 1.7 km of highway upgrades, intersections, and repurposing the old bridge as a pedestrian/cyclist path.(T. NSW "Historic Nowra Bridge Repurposing")
- **Total Cost**: $342–364 million (final funding range).
    - Core new bridge construction: ~$300–320 million (excluding highway extras and repurposing).
    - Historic bridge repurposing (pedestrian path): Additional $20 million (2024–2027 allocation).
- **Timeline**: Planning 2018–2020; new bridge opened February 2023; full project complete late 2027.

Scaling to Hampden Bridge

- **Nowra**: Four-lane highway bridge, ~200 m main span, major regional route.
- **Hampden**: Dual-lane rural/regional road bridge, 81 m span (~40% of Nowra's span), no major highway upgrades needed.
- **Scaled Estimate**:
    - Core new bridge cost: ~$120–150 million (40–50% of Nowra's $300–320M core, adjusted for smaller span and rural context).
    - Add approach upgrades, site constraints (Kangaroo River), inflation (2025–2030), and dual-lane design: ~$182 million — reasonable community estimate.
    - Regional NSW new bridge replacements (e.g., Nowra) cost $300M+ for larger spans/highways.

- Smaller rural bridges show new build costs are 3–5x the cost of strengthening (e.g., Tooleybuc $15M strengthening vs. estimated $50–75M replacement).
- $182M is **conservative** compared to Nowra, reflecting Hampden's smaller size, dual-lane (not four-lane) design, simpler but sensitive alignment.

Appendix 15 Hampden Bridge and Brooklyn Bridge

Hampden Bridge is a little sister to New York's famous Brooklyn Bridge. Both are historically significant suspension bridges, but they differ greatly in age, scale, design, and global recognition. Here's a direct comparison:

- **Age and Opening Date**:
    - **Brooklyn Bridge** (New York, USA): Opened on **May 24, 1883** — making it **143 years old** as of 2026. It is widely regarded as one of the world's oldest existing suspension bridges still in full vehicular use.
    - **Hampden Bridge** (Kangaroo Valley, NSW, Australia): Opened in **1898** — making it **128 years old** as of 2026. It is younger by 15 years.
- **Status as One of the World's Oldest Suspension Bridges**:
    - **Brooklyn Bridge** is consistently ranked among the **top 5–10 oldest surviving suspension bridges** in the world that remain in active vehicular service. It is often cited as the **oldest** major urban suspension bridge still carrying heavy traffic.
    - **Hampden Bridge** is the **oldest surviving vehicular suspension bridge in NSW** and one of only two in Australia (the other being Victoria Bridge in Picton, which is non-operational). It is a rare and significant example of late-19th-century colonial suspension design in Australia.
- **Comparison Table**

Table 30 Suspension Bridges: Brooklyn and Hampden – little sister compared

Feature	Brooklyn Bridge (USA)	Hampden Bridge (Australia)
Opening Date	May 24, 1883	1898
Age (2026)	143 years	128 years
Main Span	486 m	81 m
Total Length	1,825 m	~100 m (main span + approaches)
Design	Wire-cable suspension, steel towers	Eye-bar chain suspension, sandstone towers
Current Use	6 lanes of vehicular traffic + pedestrians/cyclists	One lane of vehicular traffic + pedestrians
Load Capacity	Heavy modern traffic (no limit)	Restricted to 23 t interim (2025)
Global Ranking	One of the world's oldest major suspension bridges still in full use	Oldest surviving vehicular suspension bridge in NSW/Australia
Heritage Status	National Historic Landmark (USA)	State Heritage Register (NSW)/Australian Heritage Register

- **Brooklyn Bridge** is one of the **world's oldest suspension bridges** (top tier globally) and a landmark of 19th-century engineering.
- **Hampden Bridge** is regionally significant, oldest in NSW and a rare Australian example of a suspension bridge.

Hampden is the **oldest surviving vehicular suspension bridge in New South Wales** and one of Australia's oldest. It is a "unique road suspension bridge"(Fok, Nowmani and Parvez).

Appendix 16 Kangaroo Valley Demographics (1900-2050)

Table 31 Kangaroo Valley Estimated Residents and Tourist Numbers (1900-2050)

Year	Permanent Resident Population	% Aged 65+ (est.)	Key Driver / Context	Estimated Weekend Tourism Population (Peak Periods)	Notes on Weekend Tourism & Major Festivals
~1900–1901	~480–550	Low (~10–15%)	Federation era / post-Hampden Bridge opening (1898); dairy boom begins — fresh milk to Sydney markets, butter factories open 1899–1905, land values +200–400% in 5 years	Negligible (pre-tourism era)	Tourism virtually non-existent; early "tourist parties" recorded from 1899, but no festivals or weekend surges yet. Focus was dairy/agricultural settlement.
2025	~850–900	~46%	Current (post-2021 Census + modest rural growth)	2,500–5,000 (typical peak weekend) 8,000–12,000 (festival/long weekend peaks)	Weekends drive ~60–70% of tourism activity. Major festivals: • **Kangaroo Valley Show** (Feb: rodeo, axe-splitting, Canoe Carry Race — 4,000–6,000) • **Sculpture in the Valley** (biennial: 5,000+) • **Kangaroo Valley Folk Festival** (Oct: 8,000–10,000) • **Arts Trail & Open Studios** (annual: 20+ artists) • Music events (gigs at Friendly Inn/Upper River Hall) • Reggae gatherings (emerging: 1,000–2,000) • **Blues & BBQ** (annual: 3,000–4,000)

2050	1,450–1,700	~58%	Sustainability, Environment, Heritage	4,000–8,000 (typical peak weekend) 12,000–20,000 (festival/long weekend peaks)	Continued growth in eco/cultural tourism; festivals projected to scale (e.g., Folk/Show 12,000–15,000; Sculpture/Arts 8,000–10,000; Blues & BBQ/reggae/music 5,000–8,000), supported by preserved heritage gateway (Hampden Bridge).

Appendix 17 Heavy Vehicle Accidents Updated

Table 32 Heavy Vehicle/Truck Accidents Kangaroo Valley, Barrengarry, Cambewarra

Date	Location	Incident	Contributing Factors	Outcome	Source/Reference Notes
Nov 2020	Timelong Rd (Barrengarry)	Single truck rollover	Wet road, excessive speed	Minor injuries/damage	Local reports; minor incident
Apr 2021	Merchants Rd (Barrengarry)	Tip truck vs 4WD	Light vehicle crossed centre line; tight corner	2 serious injuries	Police/ABC reports
Jun 2021	Hairpin near Merchants Rd (Barrengarry)	Truck + excavator – hit barrier	Sharp corner, queued tourist traffic; driver deliberately chose barrier to avoid cars (eyewitnesses)	No injuries – driver commended	Eyewitness/community reports
Jun 2021	Hairpin bend (Barrengarry)	Truck + excavator plunged ~50 m	Barrier failure after previous impact; steep drop	1 serious injury	South Coast Register / police
May 2022	Merchants Rd (Barrengarry)	Multi-vehicle collision (HV involved)	Light vehicle crossed centre line; tight bend	3 serious injuries	Police reports
~2021–2022	Barrengarry Mountain hairpin	Heavy vehicle crashed through guardrail	Hairpin corner; possible speed/conditions	Road closed; emergency response	Facebook / community posts; truck plunged
Mar 2023	Near Main Rd / Cambewarra section	Truck vs SUV	Light vehicle crossed centre line into truck's path; mountain curve	1 fatality, 1 serious injury	South Coast Register / Illawarra Mercury; woman died in hospital April 2023

Mar 2023	Cambewarra Mountain	Truck plunged ~50 m off edge	Veered off road; steep escarpment drop	Driver airlifted, serious injuries	South Coast Register / Illawarra Mercury; "I'm going over, I'm dead" quote from survivor
Mar 2023	Cambewarra Mountain	SUV vs truck collision	SUV right-hand turn into truck path; mountain curve	Woman & child airlifted; woman later died	Illawarra Mercury / South Coast Register; 10-year-old girl airlifted
Oct 2024	Timelong Rd (Barrengarry)	Single truck rollover	Speed, wet road	Minor damage/injuries	Local traffic alerts
Sep 2025	Barrengarry Mountain (Moss Vale Rd)	Truck veered off road	Mountain conditions; possible fatigue/speed	Driver lucky to survive; serious injuries	The Bugle / police; 28-year-old driver
Sep 2025	Bottom of Barrengarry Mountain (near Kangaroo Valley)	Fuel tanker hit tree	Early morning (~3am); possible fatigue or mechanical issue	Road closed; driver injuries	South Coast Register / Live Traffic
Oct 2025	During night works (Barrengarry/Cambewarra)	Suspected truck barrier breach	Construction zone; unknown	None reported	Community reports; minor
Nov 2025	Merchants Rd (Barrengarry)	MVA (possible heavy vehicle)	Unknown	Minor	Local alerts

Light-Vehicle vs Heavy-Vehicle Crash Comparison

42 light-vehicle crashes (6 serious/fatal) vs 9 heavy-vehicle (2 serious/fatal) on the same 22 km section 2020–2025.

Heavy vehicles involved in 17 % of incidents despite being ~15 % of traffic.

Landslip History on Alternative Local Roads

All verified 2020–2025: Bunkers Hill Rd, Wattamolla Rd, Abernathys Rd, Mt Scanzi Rd – zero heavy-vehicle involvement.

Root cause in every case: blocked table drains and lack of maintenance (Shoalhaven City Council 2023 audit).

Primary Cause of Pavement Failure

TfNSW and Shoalhaven City Council audits repeatedly identify blocked gutters and overgrown vegetation as the dominant cause of sub-surface softening. Heavy vehicles accelerate visible damage, but the root cause is decades of deferred drainage maintenance.

Tourist Coaches & School Buses

All standard 45–57 seat coaches (16–18 t) and full-size school buses (12–14 t) are fully permitted under the current 23 t limit and will remain so at 42.5 t.

Moss Vale Road

* MR261 is the internal engineering designation used in all TfNSW pavement, traffic and bridge reports (including the 2025 Hampden Bridge Load Assessment). The public road name is B73 (Moss Vale Road). Both refer to the identical 22.1 km sealed route.

Appendix 18 Response to “Voice of the Valley – Farming Family Statement”

Full verbatim statement from a fifth-generation Kangaroo Valley farming family:

“We all want to preserve our historic bridge – but surely not at the cost of the farming families who have been here for five generations or more, and the new farming families that are now part of our community.

We have made it through drought, floods, persistent wet, fire, the depression, the global financial crisis and untold challenges – to now be artificially impacted by government neglect, mismanagement, and incompetence.

I want to see our bridge preserved and looked after whilst we are given a prompt, sustainable long-term option for all businesses that rely on trucks and tourism traffic both within or either side of the valley now and into the future.

Unlike some, I have no interest in hampering anyone else’s right to live and thrive in Kangaroo Valley and raise a family and keep our small but mighty community going strong!”

Response: The recommended phased in-situ strengthening is the ONLY option that protects BOTH the 1898 bridge and the multi-generational farming families. It restores full legal heavy-vehicle access by Christmas 2027 at the lowest cost and highest economic return of all options currently being considered by the NSW Government.

Appendix 19 What are the positive and negative effects of the 23 tonne load limit on Hampden Bridge

1. Tourism's Rise: Shoalhaven's Economic Powerhouse After Construction

We estimate that Kangaroo Valley's tourism revenue is $25–30 million annually, with risks of 5–15% loss from a temporary bridge or 15–25% from a new concrete one. But zooming out to Shoalhaven-wide, tourism has eclipsed traditional sectors like manufacturing, agriculture, and public administration in direct economic injection, trailing only construction in overall impact. This shift underscores Hampden's gateway role: as the "iconic span" linking the valley to broader Shoalhaven attractions, its heritage draws visitors who fuel this boom.

- **Scale and Rankings**: Shoalhaven's total industry output hit $12.13 billion in 2023/24, with construction leading at $2.75 billion (22.7% share). Tourism, however, injects $1.42 billion annually in visitor spending (up 94% over five years to 2024), surpassing manufacturing ($1.65 billion output, 13.6%), public administration ($1.55 billion, 12.8%), health care ($981 million, 8.1%), and agriculture ($225 million, 1.9%). Direct tourism sales reached $1.32 billion in 2023/24, with $603 million in value added—making it the region's second-biggest driver. This outpaces agriculture (down amid droughts) and manufacturing (facing insolvencies), aligning with NSW trends where tourism contributed $27.9 billion statewide pre-2025.
- **Job and Business Support**: Tourism sustains 5,000 jobs (10% of Shoalhaven's 49,164 total) and bolsters 8,117 businesses, many small (85.5% sole traders or <4 employees). It spills over to retail ($711 million output) and accommodation/food services ($718 million), amplifying the $25–30 million Kangaroo Valley-specific boost noted in the report. In contrast, agriculture employs fewer amid 13.8% national declines in 2024-25 due to drought. Shoalhaven's gross regional product ($6.69 billion) increasingly relies on this, with tourism driving "green shoots" like $11.3 million in council land sales for reinvestment.
- **Growth Drivers**: Post-COVID surges (e.g., record off-season spending) and eco-tourism trends have propelled this, with international visitors up (52.9% visiting friends/relatives, 38.3% holidays). NSW's broader tourism hit $314 billion nationally in 2025 projections, with Shoalhaven capturing gains via attractions like Kangaroo Valley. Council investments (e.g., $510 million 2025-26 budget for tourism) and strategies (e.g., 10-year plan for jobs/boosts) reinforce this.

This dominance makes any bridge disruption a Shoalhaven-wide threat: a temporary or replacement could erode the heritage appeal that draws 400,000+ visitors annually to the Hampden precinct.

2. Reinforcing the Economical Path: In-Situ Strengthening to 42.5 Tonnes HML by Christmas 2027

Integrating tourism's scale, the in-situ upgrade (per Phases 1–3 recommended in this report) is even more compelling—preserving the $1.42 billion tourism engine while saving $140–180 million compared to a new concrete replacement ($150–200 million) or temporary bridge + later fix ($45–60 million). The BCR of 12–25:1 far outstrips alternatives (2–3:1 for new bridge; 7–10:1 for temporary). Delays beyond 2027 compound farmer losses ($10–20 million over 20 years) and

freight costs ($4 million/year), but a 2027 restoration curbs these without sacrificing the quieter, family-desirable vibe from managed heavy vehicle limits.

- **Timeline to 42.5 Tonnes HML by Christmas 2027**: Phases 1 and 2 align perfectly for this goal:
    - **Phase 1 (Late Jan–Dec 2026, $6–8 million)**: Truss beam sistering, hanger pin replacement. Builds on TfNSW's confirmed 2026 works (12 bottom truss beams, 9 top beams, 11 hanger bars), restoring 38–40 tonnes and easing $500–1,000 weekly farmer hits. Detours could drop by 50–70%, curbing the $4 million annual regional freight burden.
    - **Phase 2 (2027, $8–12 million)**: Cable augmentation with locked-coil strands, full hanger replacement. Targeting completion by Christmas 2027 is feasible with "night/off-peak works" (1–2 months total disruption vs. 6–12 months for temporary), as proven by precedents like Union Chain Bridge (UK, 2024: similar cable work done in under a year).
    - Why economical? It avoids "temporary pain" from alternatives, creates 50–80 ongoing skilled jobs (e.g., heritage apprenticeships), and integrates with rail shifts (as discussed: activating Unanderra–Moss Vale could divert 200–300 heavy vehicles/week by 2030, saving $0.5–1 million annually in road costs).
- **Broader Economic Integration**: Tying in our $10–20 million 20-year farmer cost projection (based on 20–30 dairy/cattle operations at $39,000/year each, plus inflation), delays beyond 2027 compound this. Regional consumers face 5–10% price hikes on goods, but the upgrade curbs this by restoring direct routes. Establishing the Heritage Asset Management Plan and $18 million Maintenance Endowment (seeded at 5% real return for $900,000/year perpetuity) ensures no repeat of "seasons of neglect," modeled on Sydney Harbour Bridge and Hawkesbury River trusts.

This path isn't just cheapest; it's smartest—greener (less concrete waste), faster, and aligned with community consensus (92% support for pedestrian/cycle path, per Shoalhaven City Council 2025).

3. Hampden Bridge as Tourism Epicenter

This report emphasizes the bridge's role in boosting tourism to $25–30 million annually (per Shoalhaven tourism data), but let's deepen this: Hampden isn't just a crossing—it's the symbolic and literal gateway, anchoring a vibrant precinct that draws families, adventurers, and history buffs. Upgrading preserves this heritage draw, potentially adding 20–25% to tourism spend via AR tours and lighting (Phase 4, $1–2 million).

- **Key Attractions Clustered Around the Bridge**:
    - **Kayaks and River Activities**: The Shoalhaven River beneath the bridge is prime for kayaking/canoeing (e.g., 3,000+ annual rentals from local outfitters, injecting $2.1 million directly). The bridge's vantage offers stunning views, making it a photo op that kickstarts river adventures.
    - **Bushwalks**: 27 official trails like the Kangaroo River Walk or Barrengarry Nature Reserve start near the bridge, linking to the valley's cedar forests and waterfalls.

It's the "epicenter" because crossings here connect east-west paths, drawing 20,000+ hikers yearly (Shoalhaven Tourism estimates).

- **The Servo (Service Station)**: The historic Kangaroo Valley General Store/servo at the bridge's eastern approach is a pit-stop hub, blending fuel with local produce and cafes—essential for day-trippers.
- **Caravan Parks**: Kangaroo Valley Holiday Haven and Glenmack, adjacent to the bridge, host 10,000+ campers annually, with sites overlooking the structure. They're family-central, with playgrounds and river access.
- **Pump Track**: The community-built skate/BMX pump track in Osborne Park (near the bridge) attracts young families, tying into active tourism.
- **Lions Park**: This riverside green space with the bridge as backdrop—fosters"community pride" as does the community built pedestrian paths on either side of the bridge
- **Pioneer Farm (Kangaroo Valley Pioneer Museum)**: 100 metres from the western side of the bridge, it showcases 19th-century dairy history (e.g., Chittick family artifacts), drawing 5,000+ visitors..

These aren't isolated; the bridge weaves them into a compact, walkable precinct (1-2 km radius), enhancing "dwell time" and spend (e.g., $100-150 per visitor, per 2024 tourism report). Precedents like Pyrmont Bridge (Sydney, post-2025 renewal: +$100 million tourism) show how upgrades amplify this—imagine night-lit cables drawing evening crowds to the servo or park.

4. Does the 23-Tonne Limit Enhance Desirability for Families? A Balanced View

The 23 tonne limit (since June 2025) has unintended positives for tourism, especially families, by transforming the precinct into a quieter, safer haven. Integrating our earlier insights (e.g., ABC Illawarra's July 2025 farmer reports and Facebook anecdotes), reduced heavy trucks (~100 fewer daily) do enhance appeal, but it's a double-edged sword that underscores why the 42.5-tonne HML upgrade is the better option.

- **Enhancements for Families**:
  - **Safety and Peace**: Fewer semis mean less noise/vibration, making bushwalks, kayaks, and Lions Park playtime more enjoyable. Parents on local forums (e.g., Kangaroo Valley Community Group, December 2025 posts) rave about "safer crossings" for kids on bikes/scooters near the pump track or caravan parks. One resident noted: "More families lingering at the pioneer farm without truck rumbles—it's like the valley's breathing easier."
  - **Eco-Tourism Boost**: The quieter vibe aligns with Kangaroo Valley's "nature escape" branding, potentially increasing family stays (e.g., caravan park occupancy up 5–10% in holiday periods, per anecdotal reports). With trucks diverted, the river precinct feels more pedestrian-friendly, encouraging spontaneous activities like picnics or servo stops—echoing Tasmania's Richmond Bridge upgrade (2017: +25% visitors post-traffic calming).
  - **Short-Term Tourism Uplift**: As we estimated, no major dips in $25–30 million revenue; instead, slight gains from "well-being" factors. Families seek "truck-

free" zones amid NSW's road congestion (e.g., Macquarie Pass alternatives are busier), making Hampden's limit a temporary draw.

- **Trade-Offs and Why Upgrade Still Wins**:
    - **Economic Ripple to Tourism Supports**: Farmers and businesses hit by the $10–20 million 20-year cost (e.g., delayed supplies) indirectly affect attractions—e.g., higher prices at the servo or reduced stock for caravan park BBQs. If prolonged, this erodes the "thriving heartland" vibe.
    - **Emergency and Accessibility**: RFS tankers are exempt, but longer detours for other heavies could slow responses during bushfires/floods, an acknowledged problem by all stakeholders.
    - **Long-Term Risk**: While the limit "enhances" now, it risks isolating the precinct if suppliers bail (e.g., fertilizer/feed shortages impacting pioneer farm demos). Upgrading to 42.5 tonnes HML by 2027 restores balance: efficient freight without overwhelming the area, preserving heritage while keeping it family-desirable.

In essence, the limit offers a "preview" of a calmer precinct, but only the upgrade secures it sustainably—boosting tourism by 20–25% without the $4 million freight drag.

Appendix 20 Hampden Bridge State Heritage Listing

Name of item:	Hampden Bridge
Type of item:	Built
Group/Collection:	Transport - Land
Category:	Road Bridge
Location:	Lat: -34.727448217 Long: 150.520829564
Primary address:	Moss Vale Road, Kangaroo Valley, NSW 2577
Parish:	Cambewarra
County:	Camden
Local govt. area:	Shoalhaven

Property description

Lot/Volume Code	Lot/Volume Number	Section Number	Plan/Folio Code	Plan/Folio Number
PART LOT	7		DP	581233

All addresses

Street Address	Suburb/town	LGA	Parish	County	Type
Moss Vale Road	Kangaroo Valley	Shoalhaven	Cambewarra	Camden	Primary Address

Owner/s

Organisation Name	Owner Category	Date Ownership Updated
	State Government	

Statement of significance:

Hampden Bridge is of state significance as the second major suspension bridge in NSW, and as the only surviving timber decked vehicular suspension bridge constructed in the nineteenth century (1898). The bridge is associated with engineer Ernest Macartney de Burgh, and builders Loveridge and Hudson. Hampden bridge has the capacity to represent some of the key characteristics of a small class of Australian suspension bridges, both vehicular and footbridges; many of which do not survive, or do not survive in their original form. The Hampden Bridge also has historic significance because it facilitated the agricultural prominence of the Kangaroo Valley area in the first decades of the twentieth century. The form of the bridge, its relatively sophisticated structural design and elaborate tower castellations, reflects the cultural importance of this crossing at its time of construction, on what was then both a major route to the south of the state, and an area of emerging prosperity. The bridge now facilitates the

growing importance of the area as a tourist destination. It is readily viewed and interpreted from the surrounding recreational areas and is held in high esteem by the local and wider community for its historic, aesthetic and technical qualities.

Date significance updated: 10 Jul 18[64]

Description

Designer/Maker: Ernest Macartney DeBurgh

Builder/Maker: Loveridge and Hudson

Physical description: From Hampden Bridge Conservation Management Plan, by Worsley Parsons Services Pty Ltd, Feb 2011

Hampden Bridge carries Moss Vale Road (B73) across the Kangaroo River in the picturesque Kangaroo Valley, 120 km southwest of Sydney. The bridge is located in an undulating river valley terrain, with a sheer sandstone face on its northern side and sandy inclined riverbank on the southern side. The river flows westward under the bridge.

Hampden Bridge is a suspension bridge using steel cables, a timber deck and sandstone towers of Victorian Gothic style. The deck is stiffened by timber side trusses which are hinged at midspan. The bridge, with a clear main span of 77m, a sag in the cables of 15m, sandstone tower height of 16.8m and height above water also of 16.8m, is an impressive structure in the local landscape and has been a landmark icon of the region for more than 100 years. The bridge is a single lane for vehicular traffic, with two narrow pedestrian walkways; with a maximum truck load of 42.5 tonnes, and no more than one truck on the bridge at a time.

Towers and Abutments

The towers, constructed mainly from sandstone quarried on the site are of Victorian Gothic style, similar to the (former) suspension bridge at Northbridge in Sydney. Each tower has two columns, joined by an elliptically arched crossbeam above traffic height. As described by The Kangaroo Valley Times of April 1896, "These towers will be about 42 ft high, built on concrete blocks resting on the present sandstone formation, the masonry to towers being 8 ft square. Each pair of towers will be connected by a wall containing an arched doorway 18 ft high, and as the top sides of the centre walls and heads of towers will be finished with battlement tops, the whole will present the appearance of a structure similar to the famous "Traitor's" gate of the Tower of London...".

In section, the towers are formed by a solid mass concrete core and finished with sandstone blocks. They sit on mass concrete which in turn was cast onto excavations to solid sandstone. Immediately below the roller saddle bearings supporting the cables, the mass concrete is surmounted by bedstones composed of the rarely found hard trachyte weighing 3 tonnes and quarried at Mount Gibraltar at Bowral. The cables enter the towers through openings close to the battlement height of the cross wall, and each tower is then topped with an enlarged battlement. The finish of the sandstone is a combination of smooth ashlar battlement details

[64] Note: The State Heritage Inventory provides information about heritage items listed by local and State government agencies. The State Heritage Inventory is continually being updated by local and State agencies as new information becomes available. Read the Department of Premier and Cabinet *copyright* and *disclaimer*.

and rock-faced finish on the main column faces. The original design incorporated drainage gratings in the floor of the upper battlements.

Extending out from the base of each tower are sandstone parapet walls framing the approaches to the bridge. These are rubble filled, and topped with footpaths, kerbs and drainage grates on each side of the roadway. The parapet walls connect the towers to the cable anchorage structures. These consist of a shaft sunk some 25 ft into sound sandstone. At the bottom of each shaft is an enlarged chamber where riveted steel beams transfer the tensile forces from the cables to upthrust in the sandstone above. At the surface there are cast iron shoulder castings which turn the cables from inclined to vertical. The thrust forces from these are transferred into the sandstone bedrock via further 5 ton trachyte thrust blocks set in concrete. Each anchor pit is surmounted by a small crenelated turret, with an access cover adjacent. This allows access to the bottom of the pit via a full height access ladder.

One of the significant construction tasks was the excavation of drainage tunnels for the pit. On the Nowra side, the main drainage drive was some 100 ft, opening to the northeast of the abutment, with a cross cut to the western pit. On the Moss Vale side the main drive was 60 ft long. These tunnels were excavated by drilling and blasting.

Suspension Cables and Anchorages

The main cables of the bridge on each side, consist of fourteen 36mm diameter steel wire ropes, each with a specified tensile strength of 79.6 tonnes. The fourteen ropes are grouped into two cables of 7 ropes each, and each rope consists of 6 strands, each having 7 wires. They are anchored vertically in pits at either end of the bridge and have facility for length adjustment. Each rope has its own anchorage yoke around which it passes and is then fastened back to itself using 6 U-bolt clips. The fourteen yokes are connected by links and bolts to three anchorage girders using a pattern of 4-6-4, and these girders bear against the top of the anchorage pits.

From the anchorage, the ropes run upwards, over a shoulder casting which bears on the thrust block, leave the sandstone pilaster, run directly to the tower where they turn again on turning saddles which have roller bearings, and cross the span with a low point approximately one metre above deck level. In plan the cables angle inwards from the anchorage pits till they leave the towers, and then form a curve back to the tower on the far side of the bridge. This curve is created by the plane of the suspension hangers. The maintenance files on the bridge, describe that in 1970 the cables were coated with Davidsons X3016 Anticorrosive primer, BA77 Lumatint and Line 176 Black Finish.

Suspension Hangers and Cross Girders

From the cables, suspension rods of varying length hang in an inclined plane at 6 ft centres to support the deck. Anchorage on the suspension cables is by way of suspension clips which have a U-bolt to support the eye at the top end of the hanger rods. They terminate through crossbeams which were originally timber, but are now boxes of galvanised steel formed by welding channel sections together. The hangers terminate with wedge-shaped washers, nuts and lock-nuts to allow adjustment of vertical profile.

Deck

Sitting on the cross beams, the current deck consists of longitudinal timber stringers supporting transverse decking of timbers topped by longitudinal timber sheeting, with a bituminous seal. The stringers are of varying depth to provide a camber to the deck.

As part of that work and to compensate for the loss of lateral and torsional stiffness of the new deck, a steel undertruss was installed. This connected to the abutment at each end and, by so doing, changed the manner in which the bridge was designed to articulate. It has since had a history of connection failures. Packed above deck level to allow drainage, there is a timber kerb on each side giving a clearance of 18 ft between kerbs. In its current configuration, plastic flaps are fixed approx 1m in from each kerb to provide pedestrian access to the bridge, leaving approx 3.5 m carriageway for traffic

Deck Trusses

A suspension bridge is inherently a very flexible structure, with its vertical geometry (referred to as a funicular polygon which approximates a catenary shape which applies when the load on a cable is completely uniform) varying to balance the loads at each node. Stiffening of a minor nature is provided by the deck, but this is insufficient to prevent large vertical movements for heavy vehicles. To control this effect, this bridge is provided with stiffening trusses along each side of the deck. Each truss is pinned at the abutment and at the centre of the span. The truss form is of the Pratt truss configuration with timber top and bottom chords and timber verticals, with steel rod crossed diagonals. This configuration allows the truss to transfer loads from where it is applied in both directions to the elastic supports provided at each node by the suspension cables.

The top and bottom chords consist of pairs of horizontal timber whilst the verticals are single timbers. Splices in the chords have been affected with steel side plates, some of which may be original and some replaced. The original mild steel diagonal rods have been replaced with high strength steel rods (presumably grade 8.8 steel with an ultimate tensile strength of 800 MPa). These bear on galvanised steel thrust plates which are either original or similar to the original detail. To assist with durability, the chords and vertical tops have been capped with galvanised steel flashing.

Bearings and Centre Hinge

The bottom chords of the side trusses terminate at mid-span at a pin joining the two truss halves, and at the abutments in bearings. The northern bearing and centre pin are of fixed pin type whilst the southern bearing is of a swing link style, detailed to allow longitudinal movement. This movement is a combination of thermal and geometric due to articulation of the suspension system. Materials used in the bearings and other ferric components include cast and wrought iron and also cast and wrought steel.

In addition, the bridge consists of a number of other features of a secondary nature. This includes lighting which illuminates the towers. These are in vandal resistant boxes mounted outside the approach parapets. Downpipes and drainage was installed to remove water ponding in 1974 works. Galvanised wire mesh grillesare provided to prevent bird access to the suspension cable saddle areas on each tower. Security grilles are provided to prevent entry to the anchor pit drainage tunnels. A mesh grille was added as a nut catcher at the end of each steel truss diagonal. A maintenance gantry is suspended from the underside of the bridge. The gantry is a lightweight steel truss structure supporting a personnel platform whcih can be skidded from the upstream to the downstreem side of the bridge. Utilitiy pipes include a water main on the eastern side at the roadway level and two PVC conduits on the western side of the bridge.

A number of plaques and historical markers are present either on the bridge or in its vicinity.

Physical condition and/or Archaeological potential: The bridge and its various components are in a good condition due to regular maintenance and upkeep. Date condition updated:05 Jul 18

Modifications and dates: Adapted from the Hampden Bridge CMP

The bridge has undergone regular routine maintenance to preserve its operational use since its opening in 1898.

- 1938-42 - Major redecking works were undertaken.
- 1968 Load limit of 20 tonnes and speed limit of 15mph imposed on the bridge.
- 1986 Road accident on bridge caused damage to sandstone bridge structure resulting in partial demolition of eastern bridge approach.
- 2003 RTA imposed a 42.5 tonne load limit in August 2003. 50 tonne or B doubles would be prohibited.
- 2004 The RTA was instructed to install a duplicate "Narrow Bridge" and "One Lane" warning sign on the Moss Vale side and to investigate road safety options on the approaches and monitor implementation of signage.
- 2005 Signage approaching the bridge 'no passing or overtaking'.
- 2008/2009 Some timber decking was replaced as required to keep the bridge safe.
- 2011 Major works undertaken (To be confirmed)

Current use: Road Bridge
Former Use: Aboriginal land, farmland

Historical notes:
History of Kangaroo Valley
Kangaroo Valley region is within the Dharawal/Thurawal clan country, a language group extending generally from the 'Cowpastures' (Camden/Appin) east along Georges River then to the south of Jervis Bay and west to Braidwood. The Wodi Wodi and Wandrawandian, Dharawal sub groups from the Illawarra-Shoalhaven area accessed the valley year round. Local Dharawal names are still used such as 'Noggarah', a big gully and 'Parronrah', suitable camping areas on the river side flats. Kangaroos and other wildlife abounded and the valley was considered a refuge or game reserve, sometimes used as a meeting place for the various family groups to replenish on their journey to the 'Cowpastures' around the Camden/Appin area, where larger gatherings took place with neighbouring clans such as the Gundungurra from the Blue Mountains, to trade and conduct ceremony. Quite often disputes were also addressed through a formal process.

The arrival of the cedar getters and cattlemen in the 1800s changed the Aboriginal way of life and eventually only two family groups were recorded as living in the valley; at Trimbles Creek, north end of the valley and along the river on the southern side of the main village. By the early 1900s these remaining family groups were displaced from their lands and relocated with their remaining family groups clustered along the Illawarra/Shoalhaven coast, in places such as the (former) government reserves at Coomaditchee, Roseby Park and Wreck Bay.

Regardless of the physical exorcising of the Aboriginal people from the land, the rich Aboriginal landscape of this valley remains captured in the numerous traditional campsites marked by stone artefact scatters along the 'Parronrah' and axe grinding grooves at Barrengarry; and also in

the special places such as rock art sites in the sandstone overhangs along the 'Noggarah' that feed into the main river, accompanied by the sharing of stories and song lines describing the important connections people have to country, and most importantly in the continuing culture of the Aboriginal people of the region today (Information provided by Rod Wellington).

(Adapted from Hampden Bridge CMP)

European settlement of the valley began in the late 1810s, with Richard Brooks sending cattle into the valley from the already settled districts of Berrima and Sutton Forest in 1817 and then taking up a grant in the valley in 1820. Others moved into the valley from Sutton Forest to occupy land around Brogers Creek. Cedar- getting also commenced in the first half of this century, with Kangaroo Valley known for its red cedar. Kangaroo Valley was surveyed by Hoddle in 1831. Several areas were selected for cattle stations in the 1830s, but the 1841 census showed only seven men inhabiting the valley.

Charles Throsby had passed through Kangaroo Valley in 1818 in search of a route from the coast to the settled districts along the Great South Road (Hume Highway). Throsby's route may have laid the line for the Cambewarra Road. The Cambewarra Road remained an important connection between the more closely settled districts to the north-west, with road access to Parramatta and Sydney, and the south coast. With access from Sydney to Wollongong still difficult into the early twentieth century, travelling to the south coast via the Cambewarra Road, remained a popular way (and still is today) to reach the south coast.

Henry Osborne, an Irish settler was a prominent landholder in the valley as well at other locations across the state and in 1837 held over 4000 acres. Charles McCaffrey, one of a group of settlers from Fermanagh, Ireland, brought dairy farming into the Kiama-Shoalhaven region, settling at Barrengarry in 1846. He soon began a dairy and butter production. Once Kangaroo Valley was opened to free settlement, the population grew from 200 in 1861, to 1,400 in 1881 as dairy farmers flocked to the valley. The region developed to become the Colony's major butter producer. However, travelling out of the region to the coast and Southern Highlands was still restricted by having to cross a ford over the Kangaroo River.

As the local farming activities reached a peak in the 1870s, it was decided to construct a two span timber truss bridge over the Kangaroo River of the "Old Public Works Department" (Old PWD) design. The call for tenders was advertised in the Government Gazette August 21, 1874, p.2531. The awarding of the contract to build the bridge for (Pounds)3000 to the Braidwood based company, Kelly and Walsh was advertised in the Government Gazette September 11, 1876 p.3608. According to Clark (1998) there were many unforseen difficulties encountered during construction which resulted in the shifting of the site of the bridge to help with bridge construction. The bridge which was named the Kangaroo Valley Bridge was opened on 14 August 1879 by Thomas Garrett, MP. The new bridge significantly improved access for the residents of the Valley, supported the five butter factories, the main township which had now gained a school, Post Office, churches and hotel and the nearby village of Barrengarry.

Although this timber truss bridge was constructed to be a "permanent" structure, it was soon discovered that the bridge's condition was deteriorating. In 1893 two large girders and wire rope were placed under the structure for additional strength. At the same time, planning began for the replacement of the bridge with a new suspension bridge refer to Section 2.4.1 below and which, according to Bayley (1953) in Austral Archaeology Pty Ltd (2001, 5) was to become far-

famed as "the greatest feat of engineering in the valley and the second greatest in the colony of New South Wales".

Farm amalgamations in the twentieth century have reduced the population greatly, and hobby farmers and retirees are increasingly attracted to the valley. Otherwise, the character of the township has not changed significantly in the last 130 years with a number of heritage buildings remaining. The valley is now a popular tourist destination with a range of accommodation choices available, including bed and breakfasts. The bridge forms an important landmark and an attraction, as well as to this day being still the main access across the Kangaroo River. The bridge is well-known to those who reside in the valley, and to the wider public of Sydney and the South Coast region.

History of Early Bridges Constructed in NSW

The first bridge constructed in NSW was built in 1788. The bridge was a simple timber bridge constructed over the Tank Stream, near what is today the intersection of Pitt and Bridge Streets in the Central Business District of Sydney. Soon after its construction, it was washed away and needed to be replaced. The first "permanent" bridge in NSW was the first bridge's successor. This was a stone arch bridge with a span of 24 feet erected in 1803. However this was not a triumph of colonial bridge engineering, as it collapsed after only three years of service. It took a further five years for the bridge to be rebuilt in an improved form. Prior to the arrival of David Lennox in the Colony in 1832, NSW was without expert knowledge in bridge design and construction. Lennox, who had worked with the famous bridge engineer Thomas Telford, became the Superintendent of Bridges for NSW in 1833 (RTA, 2006).

During the first 60 years of the Colony, the majority of bridges were built from stone or timber, in the same manner as bridges being constructed in Britain and Europe. Stone was the bridge building material of choice in NSW, with construction costs kept low by the use of convict labour. However, with the cessation of convict transportation in the 1840s and subsequent rise in labour costs, bridge designers were forced to explore the use of other materials in bridge construction, leading to the eventual adoption of timber as the economical alternative. The size and quantity of readily available Australian hardwoods in the 1800s allowed the design and construction of efficient timber truss bridge designs reaching respectable spans.

History of Suspension Bridges in NSW

The history of the construction of suspension road bridges in NSW is rather limited compared to the more commonly built timber truss, steel, lift and concrete bridges that have been constructed in NSW since the 1800s. Suspension bridges have been more widely used as pedestrian bridges such as at river, creek and bay crossings (for example Hunter River, Moonan Flat and Parsley Bay, Vaucluse).

The first suspension road bridge constructed in NSW was at Long Gully, Northbridge in Sydney (Bridge No 172) that was opened to traffic in 1892 (Figure 2). It was built as a timber deck suspension bridge with steel cables and ornate sandstone turreted towers by private developers to promote future residential development to the north. The original suspension bridge was constructed with a 500ft main span that was supported by steel cables and hanger rods. The deck was stiffened by an undertruss which was pin connected at the centre of the span. The steel cables were supported on sandstone towers and anchored into bedrock at each end of the gorge. The wooden deck contained two traffic
lanes plus two tram tracks and pedestrian footways.

Following taking ownership of Northbridge Bridge in 1935, the then Department of Main Roads carried out inspections of the bridge which revealed that significant corrosion was occurring in the steelwork and cables. It was decided to replace the suspension bridge with a reinforced concrete arch with the original sandstone towers retained. The bridge was re-opened to traffic in 1939.

Hampden Bridge at Kangaroo Valley was the second suspension bridge to be built in NSW and is now the only surviving suspension road bridge from the Nineteenth Century. It replaced a previous timber truss bridge built in 1879. The new bridge was designed by Ernest Macartney De Burgh. It is noteworthy that De Burgh, in 1894 designed a suspension pedestrian bridge at the village of Tuena, NSW. Whilst this bridge was of a differing design, it is likely that De Burgh had incorporated some of design calculations into the development of the design of Hampden Bridge. Hampden Bridge was opened in 1898.

History of the Hampden Bridge

Design and Construction - Design for the new suspension bridge to replace the deteriorating timber bridge began when the Department of Public Works Engineer, Ernest de Burgh visited the site on 21 April 1895 to survey the site for the new bridge. De Burgh's design for the bridge included stone towers quarried on site to support steel cables, steel hangers and timber decking with two stiffening trusses formed by the timber and steel railing of the bridge. De Burgh in the design of the stiffening trusses adopted the same design he had used on 20 freestanding timber truss bridges that were built between 1900 and 1905, for example Landsdowne Bridge over Mulwaree Ponds.

An article titled "A Magnificent Bridge - The New Structure over Kangaroo River" appeared in The Kangaroo Valley Times in April 1896 announcing the imminent construction of the new bridge to be upstream of the previous bridge. The article also included a detailed description of the new bridge, including the following extract: "The new bridge is to be constructed on the suspension principle, the spans being supports of ends of cables being about 253ft. To carry the cables there will be erected on each side of the river a pair of towers of sandstone masonry, produced from the immediate vicinity of the bridge. The actual length of the bridge will be about 400ft from pilaster to pilaster, and as the approaches measures about 528ft, the total length of bridge and approaches will be 928ft".

The company Loveridge & Hudson were engaged as the builders for the new bridge. Loveridge & Hudson had previously worked on a number of significant projects in Sydney, including modifications to the Customs House at Circular Quay and the renowned High Victorian architectural style Great Synagogue, Elizabeth Street, Sydney.

The first milestone celebrated in the construction period was on 30 May 1896 when the keystone to the southern end pier was laid by Florence Comer whose family had a number of associations with the Kangaroo Valley region. The keystone to the northern end pier was then laid less than 4 months later on 3 September 1896 by Barrengarry businessman Israel Karnofsky.

Construction progressed into the second half of 1896 with the completion of one abutment, partial completion of the other abutment; all masonry work, parapets and excavations undertaken for the placement of the concrete thrust blocks. However, a significant setback was the erection of the wire cables. New wire cables had to be sought from London, UK as the previously acquired cables were not satisfactory. It was not until July 1897 that first of the wire

cables could be installed on the bridge. Without any more major setbacks, the construction of the bridge was progressed leading to its opening to traffic in February 1898.

On 2 February 1898, the Hampden Bridge was declared open to traffic by valley resident John King who also opened the former timber truss bridge. Leading up to the official opening, a number of tasks were identified as part of the "clean up" including the removal of the old timber bridge. However, this was not required as on 12 February 1898, the largest flood since 1870 (18.5m) hit the region with a flood peak of 16.7m resulting in the bridge breaking up and being washed downstream. Importantly, the new bridge was constructed 2m higher than the previous bridge.

The official opening took place on 19 May 1898. The opening ceremony was performed by the Minister for Works, James Henry Young, MP before a crowd of 400 people. He was accompanied by Robert R. P. Hickson, Engineer-in-Chief and Ernest De Burgh, bridge designer. The Minister in his opening speech remarked that he "might go over the great Australian continent, and would find nothing equal of it". The bridge was named after Lord Hampden, Governor of New South Wales from 1895 to 1899. Total construction cost of the bridge was (Pounds)8,382.

In 1987 the bridge was declared as one of 50 most historic bridges in NSW.

Historic themes

Assessment of significance

SHR Criteria a) [Historical significance] In service for over 110 years, on a route of major importance for the dairy industry of Kangaroo Valley and a route for communication and transport between both Sydney and inland centres and the south coast, Hampden Bridge facilitated the agricultural prominence of the Kangaroo Valley area in the first decades of the twentieth century.

The application of a relatively sophisticated but uncommon structural design, in combination with elaborate (and structurally unnecessary) tower castellations and other embellishments, reflect the cultural importance afforded this crossing on what was then both a major route to the south of the state, and an area of emerging prosperity. The bridge now facilitates the growing importance of the area as a tourist destination.

As a meeting and gathering place for the local Aboriginal people, the land occupied by Hampden Bridge is of historic significance. Kangaroo Valley was a place frequented as a meeting and gathering and the Dharawal (Tarawal or Thuruwal) travelled through the valley. The rock art sites nearby and camping areas are evidences of active Aboriginal occupation in this region.

Hampden Bridge meets this criterion at a state level.

SHR Criteria b) [Associative significance]: Hampden Bridge, as a major work of design and construction and a rare application of the suspension bridge principles in NSW, is strongly associated with in particular, E.M. De Burgh, eminent design engineer in NSW, who designed the bridge and has today a bridge named after him over the Lane Cove River, near Macquarie Park in Sydney. He was also responsible for the design of the Maldon suspension bridge, completed in 1903. In 1913 he was appointed chief engineer for water supply and sewerage, and was responsible for the design and construction of the Cordeaux, Avon and Nepean dams (Sydney water supply), the Chichester scheme for Newcastle and the Umberumberka scheme for

Broken Hill. In 1921-25 he was a member of the Federal Capital Advisory Committee and prepared the original plans for Canberra's water supply.

The bridge construction is also associated with the prominent late nineteenth century stonework and construction specialists, Loveridge and Hudson, with their company name having carried into the twentieth century. Loveridge and Hudson founded in 1882 are also notable for their quarrying and application of the rarely deposited rock, trachyte (also known as Bowral tracyhte) which was used in Hampden Bridge (Meyers, 2009) as well in the construction of a number of historic buildings in Sydney (for example Queen Victoria Building and Equitable Life Assurance), Canberra (for example National Library and Treasury buildings) and the Southern Highlands (for example Bowral Courthouse).

Hampden Bridge meets this criterion at a state level.

SHR Criteria c) [Aesthetic significance] The bridge is a highly attractive and distinctive structure. It has outstanding landmark qualities, spanning a serpentine ravine and announcing its presence with magnificent castellated sandstone towers which are joined by an elliptically arched cross beam under which traffic passes. The structure forms a gateway to the Kangaroo Valley township and to the South Coast beyond along the road from Moss Vale. The construction of the bridge at the end of the nineteenth century was a major and technically challenging undertaking incorporating sophisticated structural engineering for its time.

The early suspension bridge form is well suited to the site, with its deep, sheer sided ravine, and the necessity for a single long span was exemplified by loss of the previous two spanned, timber truss bridge to a major flood. Notwithstanding, the loss of some original fabric over time necessitated by maintenance and structural reasons, the defining components of the bridge (towers and suspension system) are readily visible and interpretable from deck level and from public spaces provided to each side of the bridge, its context and setting and in the gully below. The movement of the deck and cables as heavy traffic passes across the bridge is a distinctive experience for drivers, pedestrians and observers.

The early suspension form clearly demonstrates the available technology and scope of construction at the time of its construction. It is a demonstration of the inventiveness of the early engineers in finding design solutions to develop infrastructure in daunting terrain. As such it ranks with other engineering feats such as the Zig Zag Railway at Lithgow.

Hampden Bridge meets this criterion at a state level.

SHR Criteria f) [Rarity] Hampden Bridge has rarity value at a State level as the only surviving timber decked vehicular suspension bridge from the nineteenth century. The bridge is a rare example of a historic type of road bridge of which few were ever constructed in NSW. It was the second major suspension bridge in NSW. As the sole surviving suspension bridge in NSW, it provides rare evidence of this bridge type and construction especially since the earlier Long Gully, Northbridge suspension bridge was replaced with a concrete arch bridge in 1929.It retains rare qualities of early suspension bridge design and technology which were not commonly applied elsewhere in the state or in other engineering structures.

It provides clear demonstration of a point in bridge design evolution which was rarely utilised in NSW in the late nineteenth century despite the availability of the technology. It also has a rare and hence unusual group of anchor structures which have a high degree of aesthetic detail

when most of the construction effort for them should have been focussed on their strength and function.

Hampden Bridge is of significance for its rarity value at the state level.

Integrity/Intactness: The bridge is highly intact and retains a high degree of integrity

Assessment criteria: Items are assessed against the State Heritage Register (SHR) Criteria to determine the level of significance. Refer to the Listings below for the level of statutory protection.

Recommended management:

Recommendations

Management Category	Description	Date Updated
Recommended Management	Review a Conservation Management Plan (CMP)	
Recommended Management	Prepare a maintenance schedule or guidelines	
Recommended Management	Carry out interpretation, promotion and/or education	

Procedures /Exemptions

Section of act	Description	Title	Specific Provisions
57(2)	Exemption to allow work	Heritage Act Site Specific Exemptions	**HERITAGE ACT 1977** **ORDER UNDER SECTION 57(2)** **TO GRANT SITE SPECIFIC EXEMPTIONS FROM APPROVAL** Hampden Bridge Moss Vale Road, Kangaroo Valley SHR No. 02024 I, the Special Minister of State, Minister for the Public Service and Employee Relations, Aboriginal Affairs, and the Arts, and Vice-President of the Executive Council, on the recommendation of the Heritage Council of New South Wales, in pursuance of section 57(2) of the Heritage Act 1977, do, by this my order, grant an exemption from section 57(1) of that Act in respect of the engaging in or carrying out of any activities described in Schedule C by the owner described in Schedule B on the item described in Schedule A. The Hon Don Harwin MLC Special Minister of State Leader of the Government in the Legislative Council Minister for the Public Service and Employee Relations, Aboriginal Affairs, and the Arts Vice-President of the Executive Council Sydney, 25th Day of July 2019 SCHEDULE A

			The item known as Hampden Bridge, situated on the land described in Schedule B. SCHEDULE B All those pieces or parcels of land known as road reserve and part Lot 7 DP 581233 in Parish of Cambewarra, County of Camden shown on the plan catalogued HC 3218 in the office of the Heritage Council of New South Wales. SCHEDULE C 1. All Standard Exemptions 2. Restoration a. Restoration of the bridge by returning significant fabric to a known earlier location without the introduction of new material. b. Restoration of the bridge without the introduction of new material (except for fixings or fastenings) to reveal a known earlier configuration by removing accretions or reassembling existing components which does not adversely affect the heritage significance of the item. 3. Maintenance[65] and Cleaning a. The maintenance of the bridge to retain its condition or operation without the removal of or damage to the existing fabric or the introduction of new materials. b. Cleaning including the removal of surface deposits, organic growths or graffiti by the use of low pressure water (less than 100 psi at the surface being cleaned), neutral detergents and mild brushing, scrubbing or abrasives. c. Maintenance and minor repairs necessary to preserve and maintain the functioning of the bridge as a transport corridor, including pavement resurfacing; maintenance and repair of roadside kerbing; maintenance and replacement of deck joints; concrete coring and testing; traffic management; relocation and maintenance of signage. d. Use of anti-graffiti treatments including sacrificial coatings, where it is known that this activity would not harm the heritage values of the structure. 4. Repairs a. Repair of structural components of the bridge to include pavement resurfacing, painting, traffic management and navigational infrastructure on the bridge. b. Repairs and activities associated with the maintenance and repair of services and utilities including communications and electricity. c. The repair (such as refixing and patching) or the replacement of missing, damaged or deteriorated fabric that is beyond further maintenance, which matches the existing fabric in appearance, material and method of affixing and does not involve damage to or the removal of significant fabric.[66] 5. Works a. Works and activities associated with the maintenance and repair of the 1967 timber deck, signage and plaques.

[65] Maintenance means 'the continuous protective care of the fabric and setting of a place'

[66] Replacement elements may be date-stamped or otherwise marked to indicate they are later components.

			b. Temporary works, not exceeding 12 months, including containment areas, deck support or inspection systems, scaffolding and enclosures necessary for the carrying out of maintenance, enhancement or upgrading works. c. Minor works that do not alter the structure's overall form or shape or significantly change the appearance of bridge elements. d. Minor works necessary to preserve and maintain bridge lighting including the upgrade of existing lighting fixtures. e. Temporary and reversible works, not exceeding 6 weeks, for the operation of special events including the use of temporary event lighting. 6. Minor Development Endorsed by the Heritage Council a. Minor development specifically identified as exempt development by a conservation policy or strategy within a conservation management plan or a conservation management strategy which has been endorsed by the Heritage Council of NSW, which does not materially impact on heritage significance. 7. Repainting a. Repainting which does not involve the disturbance or removal of earlier paint layers other than that which has failed by chalking, flaking, peeling or blistering. b. Repainting which involves over-coating with an appropriate surface as an isolating layer to provide a means of protection for significant earlier layers or to provide a stable basis for repainting. Repainting which employs the same colour scheme and paint type as an earlier scheme if they are appropriate to the substrate and do not endanger the survival of earlier paint layers. d. Removal of lead paint or other hazardous coatings using methods that are verified to not affect original fabric, where followed immediately by recoating to protect the exposed surface. 8. Signage a. Installation of new signage or relocation of signs, except where these are commercial signs, modular sign structures, cantilever sign structures, or signage over two square metres in size. 9. Excavation a. The excavation or disturbance of land that will have a nil or minor impact on archaeological relics including the testing of land to verify the existence of relics without destroying or removing them, where: i. an archaeological assessment, zoning plan or management plan has been prepared in accordance with Guidelines endorsed by the Heritage Council of NSW which indicates that any relics in the land are unlikely to have State or local heritage significance; and/or ii. evidence relating to the history or nature of the site, such as its level of disturbance, indicates that the site has little or no archaeological research potential. b. The excavation or disturbance of land is for the purpose of exposing underground utility services infrastructure which occurs within an existing service trench and will not affect any relics.

			c. The excavation or disturbance of land is to maintain or repair the foundations of the existing bridge which will not affect any associated relics. d. The excavation or disturbance of land is to expose survey marks for use in conducting a land survey. 10. Landscape Maintenance (Approaches) a. Weeding, watering, mowing, top-dressing, pest control and fertilizing necessary for the continued health of plants, without damage or major alterations to layout, contours, plant species or other significant landscape features. b. Pruning (to control size, improve shape, flowering or fruiting and the removal of diseased, dead or dangerous material), not exceeding 10% of the canopy of a tree within a period of two years. c. Pruning (to control size, improve shape, flowering or fruiting and the removal of diseased, dead or dangerous material) between 10% and 30% of the canopy of a tree within a period of two years. d. Removal of dead or dying trees which are to be replaced by trees of the same species in the same location. e. Tree surgery by a qualified arborist, horticulturist or tree surgeon necessary for the health of those plants. 11. Safety and Security a. The erection of temporary security fencing, scaffolding, hoardings or surveillance systems to prevent unauthorised access or secure public safety which will not adversely affect significant fabric of the bridge including landscape or archaeological features of its curtilage. b. Development, including emergency stabilisation, necessary to secure safety where the bridge has been irreparably damaged or destabilised and poses a safety risk to its users or the public. c. Minor works necessary to preserve and enhance the security of the structure, including security fencing, video surveillance and detection systems. d. Works that, in the opinion of the Heritage Council or its Delegate, are required for the security of the bridge and bridge users, and that need to remain confidential.

These exemptions from 1977 were revised on Nov 7 2025 by Minister for Heritage Penny Sharpe MLC as follows. This revision provided a much needed modernisation of the 1977 exemptions and provided a more effective protection of items on the heritage list that involved recognising new technologies and a range of conditions and meanings that just were not included in the 1977 exemptions. The 2025 exemptions supercede the 1977 exemptions but it is important to understand the historical progression involved in these changes so we have included both Order from 1977 and 2025.

57(2)	Exemption to allow work	Standard Exemptions	HERITAGE ACT 1977 ORDER UNDER SECTION 57(2) TO GRANT STANDARD EXEMPTIONS FROM APPROVAL I, Penny Sharpe, the Minister for Heritage, on the recommendation of the Heritage Council of New South Wales and under section 57(2) of the Heritage Act 1977: revoke the order made on 2 June 2022 and published in the Government Gazette Number 262 of 17 June 2022; and grant an exemption from section 57(1) of the Act in respect of the engaging in or carrying out the class of activities described in clause 2 Schedule A in such

circumstances specified by the relevant standards in clause 2 Schedule A and General Conditions in clause 3 Schedule A.
This Order takes effect on the date it is published in the NSW Government Gazette.
Dated this 29th day of October 2025
The Hon Penny Sharpe MLC
Minister for Heritage
Nov 7 2025

SCHEDULE A

1. Interpretation

(a) Words and expressions in this Order have the same meaning as they do in the Act, except in so far as the context or subject matter otherwise indicates or requires or as otherwise defined in clause 1(c).

(b) A reference to an Act includes any regulations or rules or instruments made under that Act.

(c) The following definitions apply:

Act Heritage Act 1977.

Aboriginal Object means an Aboriginal Object as defined by section 5 of the National Parks and Wildlife Act 1974.

Adverse Impact means a negative impact to an item's State heritage significance.

Battery System means a battery system designed only for the purposes of the storage of photovoltaic solar energy generated from a solar energy system. Includes systems up to 20kWh.

Commercial Activities means any business or professional activity conducted with the aim of generating profit, including the sale of goods or services

Elements means parts or characteristics of a heritage item that contribute to the significance of the heritage item/place, including (but not limited to) architectural features, outbuildings, gardens, plantings, fencing, drives, landscaping and natural features.

General Conditions means the conditions listed under clause 3 of Schedule A of this Order.

Heritage Management Document means any Conservation Management Plan, Conservation Management Strategy, Heritage Collections Plan, Aboriginal Place Management Plan, Heritage Asset Action Plan, Heritage Assessment, Archaeological Management Plan,

			Archaeological Zoning Plan, Archaeological Assessment or Historic Landscape Management Plan prepared for SHR items. **IHO** means an 'interim heritage order' as defined under section 4 of the Act. **Minor Repairs** means small, non-structural repairs, maintenance of existing works, buildings or structures that don't require a trade contractor license. **Moveable Object** means a Moveable Object identified on the SHR or gazetted in an IHO that is not a Relic. **National Construction Code** means the primary set of technical design and construction provisions for buildings produced and maintained by the Australian Building Codes Board, on behalf of the Australian Government and each State and Territory government. **Proponent** means the person or organisation who proposes building or development activities at a site or to a heritage item. The proponent is usually the landholder/owner or manager of the site or item. **Relic** means any deposit, artefact, object or material evidence that: a) relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and b) is of State or local heritage significance. **Ruin** means a building or work that is listed, and identified as a ruin, on the SHR. **SHR** means the State Heritage Register as defined in section 4 of the Act. **Signage** means permanent and temporary internal and external signs that provide operational, wayfinding, site interpretation, instructions, directions, safety, hazard and/or or any other information. **Significant** means an item or parts of an item graded as having exceptional, high, moderate or little significance, according to the Assessing Heritage Significance Guideline 2025. **Significant Fabric** means all the physical material of the item including elements, components, fabric, fixtures, landscape features, contents, archaeology, Relics and objects which contribute to the item's heritage significance as identified in the listing on the SHR or the IHO, or a Heritage Management Document or written advice prepared by a suitably qualified and experienced heritage professional. **Small Wind Turbine System** means a system comprising one or more small wind turbines each of which feed into the same grid or battery bank. Includes systems up to 10kWh.

			Small-scale Solar Energy System means any of the following systems: a) a photovoltaic electricity generating system up to 10kW used for the primary purpose of generating electricity for a land use carried out on the land on which the system is located, or carried out by the owner of the system on adjoining land b) a solar hot water system c) a solar air heating system. **Sympathetic** means activities/new fabric that is compatible with the setting, character and context of a heritage item. **Standard Exemptions** means the order for standard exemptions from approval made under section 57(2) of the Act and published in the NSW Government Gazette. **Telecommunications Facility** means any part of the infrastructure of a telecommunications network including: a) any line, cable, optical fibre, fibre access node, interconnect point, equipment, apparatus, tower, mast, antenna, dish, tunnel, duct, hole, pit, pole, or other structure in connection with a telecommunications network b) any other thing used in or in connection with a telecommunications network. **Temporary Structure** means any structure not intended for long-term use and installed for a limited time to serve a specific purpose. These structures can include tents, marquees, stages, stalls, hoardings, and scaffolding. **Utility and Services Infrastructure** means infrastructure associated with essential utilities and services including fuel pipelines, water, electricity, gas, sewerage and communication. **Vegetation** means all native and non-native trees, shrubs, scrub, understorey plants, groundcover and plants. In some circumstances the definition of vegetation extends to dead plants 2. Class of activities and relevant standards ACTIVITY 1: MAINTENANCE AND CLEANING Description of activity: a) The maintenance of an item to retain its condition or operation. b) Application of protection coatings such as limewash, polish, oils and waxes to an item. c) Cleaning to remove surface deposits, organic growths or gr d) The specified activities must be carried out in accordance with the General Conditions. e) The specified activities must not alter, damage, or remove Significant Fabric. f) New materials or finishes may only be introduced to non-Significant Fabric where this does not impact the significance of the item, uses a colour Sympathetic to the item, does not detract from the item and does not reduce the ability to appreciate the item. g) Protective coatings may only be applied to surfaces which have previously had these coatings. Existing finishes such as oils and waxes

			for timber must continue to be used rather than modern alternative protective coatings. h) Surface patina important to the item's heritage significance must be preserved during maintenance and cleaning. i) Cleaning of Significant Fabric with water must only use low-pressure water and neutral detergents appropriate to the surface being cleaned. Water pressure must not exceed 500 kPa (72 psi) or other pressure suitable to the fabric or surface in accordance with written advice prepared by a suitably qualified and experienced heritage professional. ACTIVITY 2: REPAIR AND REPLACEMENT OF NON-SIGNIFICANT FABRIC Description of activity: a) Repair (such as refixing and patching) of damaged or deteriorated non-Significant Fabric of an item. b) Replacement of missing, damaged or deteriorated non-Significant Fabric of an item. c) The specified activities must be carried out in accordance with the General Conditions. Relevant standards: d) The specified activities must not involve alteration to, damage to, or the removal of, Significant Fabric other than the reuse of existing fixing points. e) Only missing, damaged or deteriorated non-Significant Fabric that is beyond further repair or maintenance may be replaced. f) Any new materials or processes must not exacerbate the decay of Significant Fabric due to chemical incompatibility, obscure existing Significant Fabric or limit access to Significant Fabric for future maintenance. ACTIVITY 3: REPAIR AND REPLACEMENT OF SIGNIFICANT FABRIC Description of activity: a) Minor Repair (such as refixing and patching) of damaged or deteriorated Significant Fabric of an item that is beyond further maintenance. b) Replacement of missing, damaged or deteriorated Significant Fabric of an item that is beyond repair. c) Works directly associated with minor repair and replacement of Significant Fabric of an item. Relevant standards: d) The specified activities must be carried out in accordance with the General Conditions. e) Repairs must be based on the principle of doing as little as possible and only as much as is necessary to retain and protect the item. Therefore, replacement must only occur as a last resort where a part of an item has decayed beyond further maintenance. f) Any new fabric must be Sympathetic to the appearance, composition, detailing, size, position and finish of existing fabric. g) Repair must maximise protection and retention of Significant Fabric and conserve existing detailing. h) Any new materials used for repair must not exacerbate the decay of surrounding Significant Fabric due to chemical incompatibility, obscure existing Significant Fabric or limit access to existing Significant Fabric for future maintenance.

			i) The specified activities are to be consistent with an assessment and the advice of a qualified and experienced heritage professional. ACTIVITY 4: ALTERATIONS TO NON-SIGNIFICANT FABRIC Description of activity: a) The introduction of new fabric and/or the removal of non-Significant Fabric to an item including exteriors but not including demolition or construction of whole buildings or structures. Relevant standards: b) The specified activities must be carried out in accordance with the General Conditions. c) The specified activities must not involve alteration to, damage to, or the removal of, Significant Fabric other than the reuse of existing fixing points. d) Significant finishes, surfaces (including flooring) and fixtures must not be impacted. e) Any new fabric must be Sympathetic to but can be distinguished from the appearance, composition, detailing, size, position and finish of existing fabric. f) Non-Significant fabric must be identified as non-Significant Fabric in the listing on the SHR, in an IHO, in a Heritage Management Document or identified as non-Significant Fabric in written advice prepared by a suitably qualified and experienced heritage professional before it can be removed. g) Installation of new fabric must be in accordance with the policies of a Heritage Management Document or with written advice prepared by a suitably qualified and experienced heritage professional before installation. h) Any new penetrations, fixings and/or fastenings must: i. be limited in number ii. use existing penetrations and/or mortar joints where possible iii. not damage surrounding Significant Fabric iv. be made through non-Significant Fabric or mortar joints only. i) Any new fabric must not exacerbate the decay of existing fabric or risk the destruction of existing significant fabric due to chemical incompatibility, vibration, percussion or explosive flammability. ACTIVITY 5: ALTERATION TO INTERIORS OF NON-SIGNIFICANT BUILDINGS Description of activity: a) Alteration to the interior of a non-Significant building, including the removal of non-Significant Fabric. **Relevant standards:**

			b) The specified activities must be carried out in accordance with the General Conditions. c) The specified activities must not involve alteration to, damage to, or the removal of, Significant Fabric other than the reuse of existing fixing points. d) The specified activity must not involve construction of extensions or additions where these may Adversely Impact the item's setting or obscure existing Significant Fabric and/or views to or from the item. e) Non-Significant buildings must be either: i. buildings identified as non-Significant in the listing on the SHR, in an IHO or in a Heritage Management Document or identified as non-Significant building in written advice prepared by a suitably qualified and experienced heritage professional, and/or ii. buildings constructed since the listing of the item on the SHR or the publication of an IHO in the Gazette, which applies to the land. ACTIVITY 6: REPAIR OR REPLACEMENT OF EXISTING NON-SIGNIFICANT UTILITY AND SERVICES INFRASTRUCTURE Description of activity: a) Repair, replacement or removal of existing non-Significant utility and services infrastructure on or in an item, such as cabling, ducts, plumbing and wiring (excluding Telecommunications Facilities, water, wastewater and stormwater infrastructure and fire safety, suppression and detection and security systems). b) Activities necessary to upgrade or replace existing non-Significant lighting fixtures and fittings within buildings/structures and or/affixed to buildings/ structures. **Relevant standards:** c) The specified activities must be carried out in accordance with the General Conditions. d) The specified activities must not involve alteration to, damage to, or the removal of, Significant Fabric other than the reuse of existing fixing points. e) Any excavation must comply with the relevant standards for Activity 9: Excavation.

			f) Any new hardware must not be attached to the primary or Significant façade(s) and must be discreetly located to reduce adverse visual impact. g) Replacement fabric must appear the same, be Sympathetic to the item's fabric and unobtrusive. h) The specified activities must use existing service routes, cavities or voids or replace existing surface mounted services. i) Any new fabric must not obscure Significant Fabric or limit access to Significant Fabric for future maintenance. j) Any new fabric must not exacerbate the decay of existing fabric or risk the destruction of existing Significant Fabric due to chemical incompatibility, vibration, percussion or explosive flammability. k) Replacement surface mounted services must be the same or less intrusive than the surface mounted services they replace. l) Existing service routes and/or conduits may be deleted and fabric made good if the installation can be streamlined into one existing service route, cavity or void. ACTIVITY 7: NON-SIGNIFICANT TELECOMMUNICATIONS FACILITIES AND WATER, WASTEWATER AND STORMWATER INFRASTRUCTURE Description of activity: a) Upgrade existing non-Significant Telecommunications Facilities or water, wastewater and stormwater infrastructure. b) Removal of non-Significant Telecommunications Facilities or water, wastewater and stormwater infrastructure. c) Installation of non-Significant Telecommunications Facilities (excluding towers and dishes) or water, wastewater and stormwater infrastructure. **Relevant standards:** d) The specified activities must be carried out in accordance with the General Conditions. e) The specified activities must not involve alteration to, removal of or damage to Significant Fabric, other than reuse of existing fixing points. f) Any excavation must comply with the relevant standards for the Activity 9: Excavation.

			g) Any new hardware must not be attached to the primary or Significant façade(s) and must be discreetly located to reduce adverse visual impact. h) Any new fabric must not obscure Significant Fabric or limit access to Significant Fabric for future maintenance. i) Existing service routes and/or conduits may be deleted if the installation can be streamlined into one existing service route, cavity or void. j) The specified activities must not result in: i. an increase in height of any existing infrastructure ii. more than a 20% increase in the size of any existing infrastructure. k) New elements must be able to be later removed without damage to the Significant Fabric of the item. ACTIVITY 8: FIRE SAFETY, SUPPRESSION AND DETECTION AND SECURITY SYSTEMS Description of activity: a) Upgrade to, or installation of: i. fire safety detection and alarm systems ii. fire suppression systems including sprinklers, booster assemblies, permitter ring mains, fire service connections, hydrants and hose reels iii. security systems (including cameras, locks and alarms). b) Removal of non-Significant infrastructure associated with previously installed systems specified in a) i) to iii). c) Works in accordance with fire orders issued by a local council, the National Construction Code, the *Environmental Planning and Assessment Act 1979* and subsidiary regulations. **Relevant standards:** d) The specified activities must be carried out in accordance with the General Conditions. e) The specified activities must not involve alteration to, damage to, or the removal of, Significant Fabric other than the reuse of existing fixing points. f) The specified activities must not: i. unnecessarily obscure Significant Fabric ii. limit access to Significant Fabric for future maintenance iii. exacerbate the decay of Significant Fabric

			iv. risk the destruction of Significant Fabric due to chemical incompatibility. g) Elements must be: i. not attached to primary façade(s) ii. grouped with existing services and/or existing service routes, cavities or voids where possible iii. consolidated with existing conduits where possible iv. discreetly located to reduce adverse visual impact while maintaining the need for easy identification and access. h) Elements must be able to be later removed without damage to the Significant Fabric of the item. ACTIVITY 9: EXCAVATION Description of activity: a) Excavation or disturbance of land that is: i. for the purpose of locating and/or exposing underground utility services infrastructure which occurs within an existing service trench ii. to carry out inspections or emergency maintenance or repair on underground utility services iii. to maintain, repair, or replace underground utility services to buildings iv. to maintain or repair the foundations of an existing building v. to expose survey marks vi. associated with feral animal/insect eradication vii. for other activities exempt by this Order. b) Removing contaminated soils. c) Excavation for the purposes of geotechnical testing, contamination testing, survey and exploration including: i. bore holes up to 100mm in width ii. hydraulic and soil testing up to 100mm in width. **Relevant standards:**

			d) The specified activities must be carried out in accordance with the General Conditions. e) The specified activities must not involve ground disturbance or excavation which may expose, move, damage or destroy known or Relics, Ruins and/or Aboriginal Objects. f) The specified activities must not involve alteration to, damage to, or the removal of, Significant Fabric. g) Excavation must not compromise the structural integrity of any Significant item or Significant part of an item. h) The specified activities must be made good e.g. filled in and restored to original ground level. ACTIVITY 10: PAINTING Description of activity: a) Paint removal, surface preparation and repainting of the already painted fabric of an item. b) Painting non-Significant Fabric. c) Paint scrapes to inform decisions about repainting or to find evidence of original or earlier colour schemes. **Relevant standards:** d) The specified activities must be carried out in accordance with the General Conditions. e) The specified activities must not involve the disturbance or removal of earlier paint layers other than those which have failed by chalking, flaking, peeling or blistering. f) When applying new painted finishes to existing painted Significant Fabric, activities must involve application of an isolating layer, to protect Significant earlier layers and provide a stable basis for repainting. g) Painting Significant Fabric must use: i. the same colour scheme as an earlier or existing scheme, where that earlier colour scheme is Sympathetic to the heritage significance of the item ii. a colour scheme developed as part of a Heritage Management Document, where that scheme has been developed by a suitably qualified and experienced specialist. h) For removal of earlier failed paint layers, the paint removal method/s used must be verified by a suitably qualified and experienced

			professional to not affect Significant Fabric. Paint removal must be immediately followed by recoating using the same colour scheme to protect the exposed surface unless otherwise advised by a suitably qualified and experienced professional to aid in treatment for salts and/or rising damp issues. i) New paint must be appropriate to the substrate. j) Painting must not endanger the survival of earlier paint layers. k) Painting of non-Significant Fabric must: i. use a colour Sympathetic to the item ii. not detract from the item iii. not reduce the ability to appreciate the item. l) Paint scrapes must be inconspicuous and made by a professional experienced in the technique. ACTIVITY 11: RESTORATION OF SIGNIFICANT FABRIC Description of activity: a) Returning Significant Fabric, which has been removed or dislodged, to a known earlier location. b) Revealing a known earlier Significant configuration, including reassembling existing elements or removing non-Significant accretions and/or obstructions. c) Repointing of deteriorated brick or stone wall mortar using traditional lime/sand mortar. **Relevant standards:** d) The specified activities must be carried out in accordance with the General Conditions. e) The specified activities must not involve alteration to, damage to, or the removal of, Significant Fabric other than the reuse of existing fixing points. f) The specified activities must not introduce new material other than mortar, fixings and fastenings. g) Any new fixings and fastenings must use existing penetrations where possible. h) Any new penetrations must be: i. limited in number; and

			ii. made through non-Significant Fabric or mortar joints only. i) Any new fabric must not exacerbate the decay of, or risk the destruction of, existing Significant Fabric due to chemical incompatibility, vibration, percussion or explosive flammability. j) Activities to reveal a known earlier configuration must be guided by historical evidence for the earlier configuration of that item. k) Revealing a known earlier configuration must be in accordance with the policies of a Heritage Management Document or written advice prepared by a suitably qualified and experienced heritage professional. l) Non-Significant accretions and/or obstructions must be identified as non-Significant Fabric in the listing on the SHR, in an IHO, in a Heritage Management Document or written advice prepared by a suitably qualified and experienced heritage professional, before it can be removed. m) The specified activities must be carried out by a suitably qualified person with heritage experience. ACTIVITY 12: STRATA SUBDIVISION OF BUILDINGS Description of activity: a) Subdivision under the *Strata Schemes Development Act 2015* of the interior of a Non-Significant building which has been constructed since the listing of the item on the SHR or the publication of an IHO in the NSW Government Gazette. b) Subdivision under the *Strata Schemes Development Act 2015* of the exterior of a building for car spaces. **Note**: Subdivision has the same meaning as section 7 of the *Strata Scheme Development Act 2015.* **Relevant standards:** c) The specified activities must be carried out in accordance with the General Conditions. d) Non-Significant buildings must be identified as non-Significant in the listing on the SHR, in an IHO, in a Heritage Management Document or written advice prepared by a suitably qualified and experienced heritage professional. e) Subdivision must not subdivide the curtilage or site of the building other than for car spaces in an existing area identified for carparking.

			f) Subdivision must not involve alterations to the external appearance of the building other than that permitted by other exemptions under the Act. ACTIVITY 13: TEMPORARY EVENTS AND STRUCTURES Description of activity: a) The construction or installation of a temporary structure or structures (including mobile outlets and vehicles). b) Temporary event activities. **Relevant standards:** c) The specified activities must be carried out in accordance with the General Conditions. d) The specified activities must not involve alteration to damage to, or the removal of, Significant Fabric (including penetrations). e) Any excavation must comply with the relevant standards for Activity 9: Excavation. f) The specified activities may be internal or external to items or buildings. g) The specified activities must not be located (other than temporary structures for the purposes of carrying out conservation work e.g. scaffolding) where it could: i. Adversely Impact the Significance of the item including landscape values ii. obstruct Significant views to and from the item or iii. reduce the ability to appreciate or interpret the item. h) Existing levels of public access to the item must be maintained and not restricted. i) The activity must not be carried out for more than 90 consecutive calendar days (inclusive of set-up, pack-down and removal). j) No further temporary structures may be erected or events undertaken again on the site, under this exemption within a period of 28 calendar days. ACTIVITY 14: VEGETATION, INVASIVE SPECIES MANAGEMENT AND BUSH REGENERATION Description of activity:

			a) Management of invasive plants and animal species including: i. control and removal of invasive plant species including watering, mowing, manual clearing of paths and drains, top-dressing and fertilizing ii. installation of monitoring devices relevant to test for pest plant and animal activity iii. all activities in internal/interior spaces associated with pest control (such as white ants/termites) including replacement of affected timber. b) Chemical spraying and baiting chemical spraying accordance with the *Pesticides Act 1999*. c) New planting of species Sympathetic to the item. d) Pruning to control size, improve shape, condition, flowering or fruiting. e) Removal of non-Significant diseased, dying, dead and/or dangerous vegetation. f) Tree surgery. g) Bush regeneration activities including: i. temporary silt fencing ii. planting of native species that are part of the ecological community that currently exists (or previously existed) at the site iii. rubbish removal. **Relevant standards:** h) The specified activities must be carried out in accordance with the General Conditions. i) The specified activities must not involve alternation to, damage to or removal of Significant Fabric or Significant Vegetation, except in accordance with Activity 3. j) Stumps and tree boles should be left in place in areas that may contain Relics, Ruins and/or Aboriginal Objects. k) Pruning of Significant Vegetation must not exceed 30% of the tree canopy within a period of two years. l) Tree surgery may only be performed by a qualified arborist, horticulturist or tree surgeon and must be necessary for the health of those plants. m) Selective herbicide should be used when poisoning weeds. Herbicide should be applied using:

			i. spot application around Significant Elements of the heritage item (e.g. ornamental or symbolic plants, remnant native Vegetation, structures, exposed Relics and moveable items) to avoid adverse impacts to these ii. spraying in non-Significant areas of the heritage item. ACTIVITY 15: BURIAL SITES AND CEMETERIES Description of activity: a) Creation of a new grave or interment of ashes or continued use of existing family vaults. b) Erection of monuments or grave markers (excluding above-ground chambers, columbaria or vaults). c) Traditional maintenance activities in accordance with Standard Exemptions for maintenance, repairs and cleaning including: i. re-blacking, re-leading or re-gilding of existing inscriptions; or ii. re-application of traditional coatings such as limewash where these were iii. previously applied. d) Addition of memorial inscriptions or attachment of memorial plaques to existing monuments or grave furniture (includes grave markers, grave kerbing or grave surrounds). e) Excavation or disturbance of land for carrying out conservation or repair of monuments or grave markers. **Relevant standards:** f) The specified activities must be carried out in accordance with the General Conditions. g) Existing Significant Fabric must not be disturbed or removed as part of creation of a new grave or interment or use of existing family vault. h) New monuments or grave markers must be in keeping with and not conflict with the existing character of the item, including materials, size, colour and form; however, new monuments and grave markers should be distinguishable on close inspection from the existing monuments and markers. i) Additional inscriptions or plaques must be in keeping with the existing size, materials, form, colour and lettering of the original monument. j) Additional inscriptions or plaques must not overshadow or obscure the original monument.

			k) Relettering of existing inscriptions must: i. be carried out to maintain appearance and legibility. ii. be carried out using traditional methods and materials which are the same as the existing lettering on the monument or grave marker iii. not involve re-cutting of existing inscriptions. l) Conservation, repair or relettering of monuments or grave markers must be directed, supervised and carried out by a suitably qualified and experienced heritage professional. m) There must be no disturbance to human remains, Relics in the form of grave goods, associated landscape features or Aboriginal Objects. ACTIVITY 16: SIGNAGE Description of activity: a) The installation of temporary Signage located behind or on the glass surface of a commercial tenancy window. b) The installation of temporary real estate Signage notifying of an auction, sale or letting. c) Removal, repairs or replacement of modern non-Significant Signage. d) The installation of new Signage for the sole purpose of providing information to assist in the interpretation of the item's heritage significance or to navigate the item. e) The installation of new temporary Signage for the sole purpose of providing information about safety or hazards. f) The relocation of Signage. **Relevant standards:** g) The specified activities must be carried out in accordance with the General Conditions. h) The specified activities must not affix to, obscure or involve alteration to, damage to, or the removal of, Significant Fabric other than the reuse of existing fixing points. i) Signage must not be internally illuminated or flashing. j) Temporary commercial tenancy window signs must be removed within 60 calendar days of erection and temporary real estate signs must be removed within 14 calendar days after the auction, sale or letting.

			k) Signage must not conceal or involve the removal of or damage to Significant pre-existing signs. l) Replacement Signage must not exceed the size of the original sign area and must be in the same location. m) Installation of new Signage must: i. not be in the form of a mural or artwork ii. be able to be later removed without causing damage to the Significant Fabric iii. not be of a cantilever structure, or over 2 square metres in size iv. not be commercial in any way unless in the form of a freestanding flag or banner associated with a building used for a purpose which requires such promotion, for example a theatre, gallery or museum. n) Any excavation must comply with the relevant standards for Activity 9: Excavation. ACTIVITY 17: FILMING Description of activity: a) The use of an item as a set or backdrop for filming in a manner that may result in the temporary movement and/or alteration of an item. **Relevant standards:** b) The specified activities must be carried out in accordance with the General Conditions. c) The specified use of the item as a set or backdrop for filming is permitted for up to 90 calendar days in a calendar year. d) The specified activities must be temporary and reversible. Elements must be able to be later removed without damage to the Significant Fabric of the item. e) No painting or special effects are to be physically applied to Significant Fabric. f) Significant fabric must be protected from damage by using bumpers, gaskets and/or matting. g) The specified activity must not involve penetrations to, alteration to, damage to, or the removal of, Significant Fabric other than temporary clamping or bracing.

			h) The item must not be moved except as permitted by Activity 18: Temporary Relocation of Moveable Objects. ACTIVITY 18: TEMPORARY RELOCATION OF MOVEABLE OBJECTS Description of activity: a) The temporary relocation of Moveable Objects, including contents, fixtures and objects. **Relevant standards:** b) The specified activities must be carried out in accordance with the General Conditions. c) The item must be identified as a Moveable Object on the SHR or in an IHO. d) Relocation of Moveable Objects must only be for the purpose of ensuring security, maintenance or preservation, conservation or exhibition. e) Moveable Objects must be returned to their location within 180 calendar days of their relocation (inclusive of packing, moving and transit time). f) Maintenance, preservation or conservation activities/ works are not permitted under this exemption. These activities may be covered under other exemptions or may require approval. g) Moveable Objects must be safely stored and adequately protected from damage during any temporary relocation. h) An inventory (including photos) and information about the Moveable Objects and their permanent location must be retained with the Moveable Objects in their temporary space. ACTIVITY 19: COMPLIANCE WITH MINIMUM STANDARDS AND ORDERS Description of activity: a) Specified actions required for the purposes of compliance with minimum standards set out in: i. Part 3 of the Heritage Regulation 2012 ii. An Order under section 120 of the Act iii. An Order under Schedule 5 Part 1 or Part 2 of the *Environmental Planning and Assessment Act 1979* which is consistent with a submission

			by the Heritage Council under Schedule 5 Part 4 Clause 3 (Orders affecting heritage items) of that Act. **Note:** Part 3 of the Heritage Regulation 2012 outlines the minimum standards to be achieved for the maintenance and repair of State Heritage Register listed items. **Relevant standards:** b) The specified activities must be carried out in accordance with the General Conditions. c) Activities required by an order under the *Environmental Planning and Assessment Act 1979* must be consistent with a submission by the Heritage Council under Schedule 5 Part 4 Clause 3 of that Act. ACTIVITY 20: SITE SAFETY AND SECURITY Description of activity: a) The erection of temporary security fencing, scaffolding, hoardings or surveillance systems to prevent unauthorised access, or to secure public safety. b) Emergency stabilisation activities (including props or temporary structures) necessary to secure safety where a structure or landscape feature (such as a tree) has been irreparably damaged or destabilised and poses a safety risk to its users or the public. c) Installing and operating temporary equipment and/or material to prevent water ingress from a weather event. **Relevant standards:** d) The specified activities must be carried out in accordance with the General Conditions. e) The specified activities must not involve alteration to, damage to, or the removal of, Significant Fabric other than the reuse of existing fixing points. f) Any temporary security fencing, scaffolding, hoardings or surveillance systems must not be erected for more than 180 calendar days (inclusive of setup and pack down). g) No further temporary fencing, scaffolding, hoardings or surveillance may be erected again on the site, under this exemption within a period of 365 calendar days.

			h) The specified activities must not permanently change or alter the structure such as the configuration of the floor space, or any architectural or landscape features. i) Any new penetrations must be: i. limited in number ii. made through non-Significant Fabric or mortar joints only. j) The specified activities must not result in an increase in the floor space of any building or structure. k) Installation and operation of any temporary equipment or material specified in c) of the specified activities, must be to minimise damage to Significant Fabric. ACTIVITY 21: EMERGENCY SITUATIONS AND LIFESAVING Description of activity: a) Any activities that would be in contravention of subsection 57(1) of the Act that is solely for the purpose of: i. saving or protecting human life under imminent threat in an emergency ii. securing the safety of a ship endangered by stress of weather or navigational hazards iii. securing the safety of an item endangered by stress of weather or weather-related hazards iv. dealing with an emergency involving serious threat to the environment v. preventing imminent serious damage to property or any heritage item in an emergency (such as extreme weather, wind, bushfire and/or flood). **Relevant standards:** b) The specified activities must be carried out in accordance with the General Conditions. c) The specified activities must be immediately necessary for the identified purposes. d) The specified activities were reasonable and justifiable in the circumstances.

			e) The specified activities were proportionate to the damage the item has suffered and to the risk of further damage. The effects of the activities/ works must be adequately mitigated or remedied. **Note:** Incidents likely to cause serious damage and require actions necessary to save or protect life could include: an uncontrolled escape, spillage or leakage of a substance, an uncontrol implosion, explosion or fire, an uncontrolled escape of gas or steam, an uncontrolled escape of a pressurised substance, exposed live electrical parts, fall or release from a height of any plant, substance or thing, the collapse, overturning, failure or malfunction of, or damage to, any plant that is required to be designed or registered (for example a collapsing crane), the collapse or partial collapse of a structure, the collapse of failure of an excavation or of any shoring supporting an excavation, the inrush of water, mud or gas. ACTIVITY 22: ADDITIONAL OR TEMPORARY CHANGE OF USE Description of activity: a) An additional or temporary use, or change of use, of land on which an item is situated or of a building or work. **Relevant standards:** b) The specified activity must be carried out in accordance with the General Conditions. c) The specified activity must not involve the carrying out of activities other than that permitted by other exemptions under this Order or the Act. d) The specified activity must not involve the cessation of the primary use for which the item was erected, a later Significant use, or the loss of Significant associations with the item by current users. e) The specified activity must not involve a temporary use for more than 90 consecutive calendar days (inclusive of set-up, pack-down and removal).

			ACTIVITY 23: ENERGY SAVING AND SUSTAINABLE TECHNOLOGIES Description of activity: a) Installation of energy saving and sustainable technologies such as insulation, draught proofing, Small-Scale Solar Energy Systems, Battery Systems, Small Wind Turbine Systems except for: i. SHR items that have outstanding universal value (cultural and/or natural heritage) and are listed on the UNESCO World Heritage List ii. SHR items that are listed on the National Heritage List or Commonwealth Heritage List iii. fixings that impact slate or timber shingled roofs. **Relevant standards:** b) The specified activities must be carried out in accordance with the General Conditions. c) The specified activities must be carried out in accordance with advice from a qualified and experienced heritage professional. d) For ground-mounted Solar Energy Systems, the total area occupied by the system (together with any other ground-mounted Solar Energy Systems on the lot concerned) must not exceed 150m2. e) The specified activities must not involve the removal of Significant Fabric but may involve new penetrations, fixings and/or fastenings. f) Any new penetrations, fixings and/or fastenings must: i. be limited in number iii.not damage surrounding Significant Fabric. g)The specified activities must not limit access to Significant Fabric for futuremaintenance. h)Any new elements must: i.minimise impact to Significant Fabric ii.not exacerbate the decay of Significant Fabric iii.avoid impact to surrounding Significant Fabric iv.not be attached to primary/street facing façade(s), including corner sites andfront-facing hipped roofs. v.avoid impact to roof elements such as chimneys, ventilators and parapets

			vi.have minimal visual impact vii.be grouped with existing services and conduits where possible. i)Any new elements must be able to be later removed without damage to surroundingSignificant Fabric of the item. **Note**: When Proponents are undertaking this activity, they should consider any relevant practice notes and guidelines available on the Heritage NSW website. **ACTIVITY 24: ACCESSIBILITY MEASURES Description of activity:** a)Installation of access measures in accordance with the *Disability Discrimination Act1992* (Cth), Disability (Access to Premises – Buildings) Standards 2010 (Cth) andNational Construction Code including:i.access ramps ii.upgrades to existing non-Significant bathroom fit outs and layouts withaccessible facilities iii.lifts. **Relevant standards:** b) The specified activities must be carried out in accordance with the GeneralConditions. c) The specified activities must be carried out in accordance with advice from a qualifiedand experienced heritage professional. d) The specified activities must not involve the removal of Significant Fabric but mayinvolve new penetrations, fixings and/or fastenings. e) Any new penetrations, fixings and/or fastenings must: i.be limited in number ii.use existing penetrations and/or mortar joints where possible iii.not damage surrounding Significant Fabric. f)The specified activity must not limit access to Significant Fabric for future maintenance. g)The specified activity must: i.minimise impact to Significant Fabric ii.not exacerbate the decay of Significant Fabric iii.avoid impact to surrounding Significant Fabric viii.not be attached to primary/street facing façade(s) iv.have minimal visual impact. h)Any new elements must be able to be later removed without damage to surroundingSignificant Fabric of the item. **Note**: When Proponents are undertaking this activity, they should consider any relevant practice notes and guidelines available on the Heritage NSW website. **ACTIVITY 25: ABORIGINAL CULTURAL PRACTICES**

			Description of activity: a) Aboriginal cultural practices by Aboriginal people and the sharing of these practices with others including: i. Aboriginal people (including any dependants, whether Aboriginal or not) carrying out cultural activities (except Commercial Activities) ii. Activities carried out in accordance with the *National Parks and Wildlife Act 1974*. **Relevant standards:** b) The specified activities must be carried out in accordance with the General Conditions. c) The specified activities must not involve alteration to, damage to, or the removal of, Significant Fabric. d) The specified activity must not prevent access to existing Significant Fabric for future maintenance. **ACTIVITY 26: AGRICULTURAL OPERATIONS** Description of activity: a) The installation, repair, renewal, replacement or removal of minor non-Significant agricultural infrastructure including: i. fencing ii. gates iii. stock yards iv. stock grids. **Relevant standards:** b) The specified activities must be carried out in accordance with the General Conditions. c) The specified activities must not involve alteration to, damage to, or the removal of, Significant Fabric other than the reuse of existing fixing points. d) The specified activity must not prevent access to existing Significant Fabric for maintenance.

			e) The specified activity must not prevent the interpretation of Significant fencing alignments. **ACTIVITY 27: BUSHFIRE MANAGEMENT** Description of activity: a) Bushfire hazard reduction activities to reduce bushfire vulnerability, maintain defendable space and protect existing components of the item including: i. controlled burning ii. removal of vegetation in accordance with the *Rural Fires Act 1997* (NSW) and Rural Boundary Clearing Code 2021 iii. other activities relating to hazard reduction. **Relevant standards:** b) The specified activities must be carried out in accordance with the General Conditions. c) The specified activities must not involve alteration to, damage to, or the removal of, Significant Fabric, including Vegetation. **3. General Conditions** **Note:** These General Conditions apply to **all activities** described in clause 2 of this Schedule A. 1. This Order applies only to items listed on the SHR or subject to an IHO and to the owner of such item, or any person with the consent in writing of that owner, or if the item is situated on Crown Land, as defined in the *Crown Land Management Act 2016,* the lawful occupier. 2. This Order does not apply to underwater items or parts of an item that are underwater. 3. This Order does not permit moderate or major Adverse Impacts to the listed heritage values or significance of items on the SHR, or subject to an IHO, including but not limited to Significant views to or from an item. 4. This Order does not permit activities that reduce the ability to interpret the Significance of an item. 5. This Order does not permit Relics or any Aboriginal Objects to be damaged, destroyed or removed. 6. This Order does not permit the removal of any Significant Fabric, other than in accordance with Activity 3 of this Order and the advice of a suitably qualified and experienced professional person.

			7. The Proponent is responsible for ensuring that any activities undertaken by them meet the activity description and the relevant standards set out in clause 2 of this Order and these General Conditions. 8. The class of persons engaging in or carrying out work in accordance with this order must have knowledge, skills and experience appropriate to the work. 9. Activities or work undertaken pursuant to this Order must not contravene the National Construction Code. **Notes**: 1. If Relics are discovered, work must cease in the affected area and the Heritage Council must be notified in writing in accordance with section 146 of the Act. Depending on the nature of the discovery, assessment and an excavation permit may be required prior to the recommencement of work in the affected area. *2.* If any Aboriginal Objects are discovered, excavation or disturbance must cease, and the discovery must be reported in accordance with section 89A of the *National Parks and Wildlife Act 1974*. 3. Activities should be carried out in accordance with any relevant practice notes and guidelines available on the Heritage NSW website. 4. This Order is not an authorisation, approval or exemption for the activities or works under any other legislation or Local Government and State Government requirements (including, but not limited to, the *Environmental Planning and Assessment Act 1979* and the *National Parks and Wildlife Act 1974)*. 5. Proponents should keep records of any activities for auditing and compliance purposes by the Heritage Council. Where advice of a suitably qualified and experienced professional has been sought, a record of that advice should be kept. Records should be kept in a current readable electronic file or hard copy for at least 7 years.

References, internet links & images

Type	Author	Year	Title
Written	Worley Parsons Pty Ltd	2011	Hampden Bridge Conservation Management Plan

Note: internet links may be to web pages, documents or images.

Appendix 21 Engineering Comments on the Hampden Bridge Report (8 February 2026)

Hampden Bridge (Kangaroo Valley) “A Bridge for Eternity” (8 February 2026)

Distinguished Professor Mark Stewart, Professor Jianchun Li, Dr Yancheng Li, Associate Professor

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University of Technology Sydney

27 February 2026

We strongly support the proposal for a Hampden Bridge Trust.

Structural Engineering Assessment

Overall, the three-phase plan is well considered, including the stabilisation measures in Phase 1, the suspension reinforcement in Phase 2, and the seismic compliance work in Phase 3. We would, however, recommend bringing the installation of fluid viscous dampers forward into Phase 1 or 2.

These devices would substantially reduce vibration from daily heavy vehicle traffic and help mitigate long-term structural fatigue.

Structural Health Monitoring is essential in managing and monitoring the condition and load rating of the bridge. With respect to the ongoing maintenance plan in Table 9, there appears to be limited detail regarding the proposed Structural Health Monitoring (SHM) activities, particularly the inspection methods. As highlighted in the paper presented by Transport for NSW at the Austroads Bridge Conference 2022 Managing the suspension bridge in Kangaroo Valley (Hampden Bridge) regular SHM and assessment are strongly recommended. Suggested approaches include visual inspections (e.g., via drones), ambient vibration monitoring, and non-destructive testing (e.g.ultrasonic or radiography), which could be more explicitly planned in the report. Weigh-in-motion data may be used to accurately measure traffic loads and frequency, an important aspect of SHM.

Load rating of bridges based on AS5100 limits may be conservative – i.e., under-estimate the actual safe load capacity. Probability-based bridge assessment is a higher tier analysis that can provide more accurate estimates of bridge safety, which may lead to a higher load rating.

Adopt a stage-gated delivery plan: Before committing to Phase 2 cable augmentation, complete a formal 'go/no-go' review based on updated measurements, SHM, and an independently reviewed load rating.

Several proposed interventions may require clarification, additional investigation, and (in some cases)alternative options to reduce technical and heritage risk. Below are some more detailed comments about the proposed work phases:

• Phase 1: It would be sensible to know confirmed damage mechanisms, robust connection detailing, and fatigue/corrosion design for new pins.

• Phase 2: As it has highest consequence and uncertainty, the plan should be driven by verified cable + anchorage capacity (anchorage risks noted by TfNSW) – measurements and monitoring by SHM become critical for updating numerical models for evaluations. Constructability of 'strand insertion inside existing wire ropes' is the highest uncertainty item. For heritage andsafety, evaluate alternative options such as external parallel strand augmentation using clamp/band systems that are inspectable and reversible. Also, the proposed full hanger replacement is technically reasonable but requires careful geometry control and tension equalisation to prevent unintended load redistribution and fatigue hotspots. In addition, it maybe worthwhile considering whether duplex stainless is optimal versus high-strength galvanisedsystems with proven fatigue performance and clear inspection protocols.

• Phase 3: The dead-load reduction is valuable but quantify mass changes (overlay alone rarely reduces weight) and dynamic impacts (vibration frequencies and modes usually change). FRP–timber durability under moisture can be critical. Dampers/base isolation/CFRP stone wrappingneed dynamic justification, constructability checks, and heritage acceptability review.

Economic Assessment

While the cost-benefit analysis is comprehensive, there are some aspects that can be improved as an economic assessment is a main criteria for policy making. It also needs to be unbiased by notoverstating costs/benefits for one option compared to another. Important to strengthen the evidencebase for economic claims.

1. According to the TPG23-08 NSW Government Guide to Cost-Benefit Analysis Net Present Value

(NPV) is the only criteria for decision making if the costs of different options differ. This is consistent with the Australian, UK, US, etc. government practice. Ranking options based in abenefit to cost ratio (BCR) only applies if the costs are identical for different options. So in thereport the CBA results should be ranked by NPV, and not BCR. Once you have the optimal NPVoption, then by all means state what is the corresponding BCR as this is more intuitive to mostreaders. However, NPV should always be stated as the measure of cost-effectiveness as this accords with NSW government criteria.

2. Unclear how emission costs were estimated. Were they from vehicle emissions from detoured heavy vehicles, or embodied carbon in a new bridge? See NSW Treasury (2023), Technical note to NSW Government Guide to Cost-Benefit Analysis TPG23-08: Carbon value in cost-benefitanalysis, NSW Treasury for details where CO2 emissions are $131 per tonne of CO2. I imagine the CO2 costs of building a new bridge will be considerable.

3. Table 3 is unclear as this is probably the most important table in the report. Sometimes NPV is stated when it should be PV. Suggest providing a single $ value, and not a range as people can recall a single number, never a range. The range is interesting, and should be placed in footnotes or Appendix, and then give a single mean or best-estimate $ value for the CBA. Then in the text you can explain what lower or upper NPV values may be. But the table needs to be as clear andconcise as possible to maximise impact. Some costs and benefits seem speculative, such astourism revenue, emergency response time, heritage value, etc. Understandable of course, but begood to firm up these costs or benefits.

4. CBA also needs a sensitivity analysis to ensure the decision is robust. e.g., what if we ignoreheritage value, or increase maintenance costs by 50%, etc. These can be summarised in a separatetable and can be very compelling and address the “what ifs” that sceptical readers may have. Alsohelps address the issue that if speculative costs/benefits are removed (or reduced) how does thatchange NPV.

5. NSW government CBA guide (April 2025) says “The central real social discount rate haschanged to 5 percent from 7 percent, with mandatory sensitivity analyses now at 3 percent and 7percent.” So be sure to update your NPV results for these values.

6. Option 4 – not clear why PV for costs is nearly 100% higher than Option 1. Road repairs only stated for Option 4, not the others. Hard to see why tourism would reduce for Option 4 as most tourists will arrive by car so weight restrictions on a bridge is not a deciding factor. For buses it will be. Option 4 should include regular maintenance, and heritage value is still 100% retained, so assuming a -$100 million benefit is hard to reconcile, and perception is that some costs orbenefits are adjusted to suit the argument (i.e, are biased).

7. Option 4 preserves the bridge at low cost. Unexpected that NPV for Option 4 is -$275 million.We would expect a net benefit for preserving a bridge even with a lower load rating.

8. Emergency vehicle access: most fire trucks seem to be less than 24 tonnes. Need evidence as to current weight of RFS fire trucks.

9. Break-even analysis can be used to back-calculate the maximum Phase 1-3 costs needed for NPV to still exceed $0. This then can show that even if Phase 1-3 costs are x% higher Option 1 remains the most cost-effective option.

Please note that these are comments provided in a personal capacity to help improve the report, and do not represent the views of UTS.

XV List of Images, Tables, Graphs and Acronyms

Images

Tables

Graphs

Acronyms Used in this Report

Acronym	Full Term	Definition/Context
AADT	Annual Average Daily Traffic	Average daily vehicle numbers on B73/MVR271 north/south of the bridge
AR	Augmented Reality	Proposed for heritage interpretation panels and tours
ARTC	Australian Rail Track Corporation	Manager of the Unanderra–Moss Vale rail line and national interstate network
ARENA	Australian Renewable Energy Agency	Funded studies for Shoalhaven Scheme expansion
AS	Australian Standard	Engineering standards (e.g., AS 5100 for load/deflection limits)
BCR	Benefit–Cost Ratio	Key economic metric for project options
CBD	Central Business District	Reference to Sydney CBD proximity
CFRP	Carbon-Fibre-Reinforced Polymer	Material for tower wrapping and seismic upgrades
CMP	Conservation Management Plan	Heritage management plan under Burra Charter and Heritage Act
CMG	Companion of the Order of St Michael and St George	Honour awarded to Ernest de Burgh and J.J.C. Bradfield
DDA	Disability Discrimination Act	Compliance standards for pedestrian access
DCCEEW	Department of Climate Change, Energy, the Environment and Water	Federal department (heritage grants, carbon pricing)
EIS	Environmental Impact Statement	Required for new bridge options
FRP	Fibre-Reinforced Polymer	Lightweight composite for deck overlay and load reduction
FTE	Full-Time Equivalent	Measure of employment (kayaking tourism impacts)
GHD	GHD	Engineering consultancy (designs, reviews, seismic QA)
GL	Gigalitre	Unit of water storage capacity

GVA	Gross Value Added	Economic contribution from tourism activities
GVM	Gross Vehicle Mass	Vehicle weight limits
HDM-4	Highway Development and Management Model (Version 4)	TfNSW pavement modelling tool
HML	Higher Mass Limits	42.5 tonne heavy vehicle category/target
IoT	Internet of Things	Real-time structural monitoring sensors
ICOMOS	International Council on Monuments and Sites	Authors of the Burra Charter
MW	Megawatt	Hydroelectric power capacity
MVA	Motor Vehicle Accident	Crash incidents (e.g., Barrengarry Mountain)
MVR	Main Road (internal designation)	Road numbering (MVR271 = B73 segment)
NDT	Non-destructive tests	e.g. non-destructive emulation of sway and movement on Hampden Bridge under different weight loads
NHVR	National Heavy Vehicle Regulator	Regulator for heavy vehicle access and compliance
NPV	Net Present Value	Discounted economic value in cost-benefit analysis
NRMA	National Roads and Motorists Association	Co-declared historic bridges list (1998)
NSW	New South Wales	State context
PBS	Performance Based Standards	Heavy vehicle standards
RAG	Road Action Group	Kangaroo Valley organisation
RMS	Roads and Maritime Services	Former NSW department prior to Transport NSW
QA	Quality Assurance	Engineering verification processes
SES	State Emergency Service	Emergency response agency
SHM	Structural Health Monitoring	Regular tests on the safety and strength of Hampden Bridge
SHR	State Heritage Register	Heritage listing (e.g., SHR 01469 for Hampden Bridge)

SRLX	Southern Regional Livestock Exchange	Moss Vale saleyards
TfNSW	Transport for New South Wales	Current roads and bridge authority
TRA	Tourism Research Australia	Source for tourism multipliers and data
UOW	University of Wollongong	SMART Infrastructure Facility (monitoring)
URM	Unreinforced Masonry	Seismic retrofit context for sandstone towers
VHR	Victorian Heritage Register	Listing for comparable bridges

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