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Safe Bodies, Hot Plastic? Practical Issues in the Introduction of High-Visibility Workwear (Hi-Vis) in Australia, 1960s–80s

JESSE ADAMS STEIN, ELIZABETH HUMPHRYS & BETTINA FRANKHAM

Fluorescent high-visibility workwear ('hi-vis') first appeared in Australia in the 1960s to improve worker safety. Despite its contemporary ubiquity, little is known about hi-vis' emergence. This research, using archives, artefacts, and photographs, traces the early years of hi-vis in Australia. Initially introduced by public-service employers for high-risk users, adoption varied widely. Drawing on examples from roads and railways, the authors examine key factors influencing initial uptake of hi-vis, including practicality, thermal comfort, and industry-specific risks. Other contributing factors included legal frameworks and growing awareness of work health and safety. Later, changing social attitudes and globalised production dynamics were key; however, this article focuses on the early decades. Ultimately, the authors find that early uses of hi-vis were grounded in practicality and safety, and the state played a crucial role. More recent uses of hi-vis – as performative costume or as everyday workwear – mark a shift away from initial safety intentions.

Introduction: Sixty years of hi-vis

High-visibility safety workwear (hereafter 'hi-vis') consists of fluorescent-coloured and retroreflective garments designed to make workers more visible around dangerous moving equipment, thus reducing workplace risks of injury or death. Hi-vis was introduced in the 1960s as a one-size-fits-all vest, typically worn over standard workwear. Hi-vis garments were originally intended to be worn *only* in high-risk settings (for example, where workers laboured near live traffic), and vests tended not to be owned by individuals, but kept on worksites for temporary use. Such garments are in the category of personal protective equipment (PPE). High-risk settings that saw early uses of hi-vis include railways, road construction, emergency services, and airport ground crews. It was

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not until the first and second decades of the 2000s that hi-vis began to expand into broader workplace use and public visibility, and that garment types shifted to all-day wear – becoming, in some instances, a genre of fashionable clothing, rather than a form of PPE. Prior to the 2000s, hi-vis was a relatively uncommon sight, generally reserved for high-risk situations involving moving machinery.

Now a diverse garment range, hi-vis is today understood as essential workwear in *all* industrial, transportation, and emergency-services sectors in Australia. The forms and colours of (compliant) hi-vis are to some extent dictated by national and international (ISO) standards, and some uses are mandated by state and federal work health and safety (WHS) legislation.[1] But beyond these regulatory frameworks, hi-vis is now routinely worn for non-safety purposes, for example, by politicians at press conferences, security guards in retail stores, office cleaners, or social media influencers.[2] Hi-vis' symbolic valences can be as variable as its modes of use, depending on the wearer and the context. In Australia, hi-vis can signify: working-class masculinity, the 'tradie' (tradesperson) identity, respectable work, political protest, authority, official access, or productivity (and so on).[3] Prominent overseas uses of hi-vis – such as the Gilet Jaunes protest movement in Europe – further indicates that hi-vis carries distinct meanings in other geographies.[4]

Given this contemporary omnipresence of hi-vis, when we embarked on this research we were initially surprised to find that there is little scholarly historical work on how hi-vis workwear came to take on such a role in Australia (or elsewhere, for that matter). This article steps into that vacuum. Drawing on archival and photographic sources, interviews, media records, and artefacts, this article traces the early decades of hi-vis in Australia, focusing on the 1960s to the

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[1] British Standards Institution, *Specification for Colours for High-Visibility Clothing*, BS 4610:1970, London, 1970. The current relevant standards in Australia are: *AS/NZS 1906.4:2023 Retroreflective Materials and Devices for Road Traffic Control Purposes – Part 4*: *High-Visibility Materials for Safety Garments,* Sydney and Wellington: Standards Australia/Standards New Zealand, 2023; *AS 4602.1:2024, High-Visibility Safety Garments – Part 1: Garments for High-Risk Applications*, Sydney: Standards Australia, 2024. WHS legislation in Australia is state-based, but, for example, the current relevant regulation pertaining to the use of personal protective equipment in NSW is: NSW Work Health and Safety Regulation 2017 (NSW Reg 404), ch. 3, pt. 3.2, div. 5, 2017; current version effective from 1 March 2025, https://legislation.nsw.gov.au/view/html/inforce/current/sl-2017-0404#ch.3-pt.3.2-div.5.

[2] Elizabeth Humphrys, Jesse Adams Stein, and Bettina Frankham, 'The Deep Political Power of Fluro: How Hi-Vis Became a Symbol of Working-Class Masculinity', *The Conversation*, 18 September 2024, https://theconversation.com/the-deep-political-power-of-fluro-how-hi-vis-became-a-symbol-of-working-class-masculinity-238584.

[3] In other published work (forthcoming) we delve more deeply into the politics of hi-vis (protest, politicians, gender).

[4] There is a growing field of political and cultural analyses of the Gilet Jaunes movement in Europe and elsewhere, e.g.: M.J. Carpenter and B. Perrier, 'Yellow Vests: Anti-Austerity, Pro-Democracy, and Popular (Not Populist)', *Frontiers in Political Science* 5 (2023): 1037942 ; Stefan Kipfer, 'What Colour Is Your Vest? Reflections on the Yellow Vest Movement in France', *Studies in Political Economy* 100, no. 3 (2019): 209–31; Julie Martin et al., 'Yellow Vests: Representation and Self-Mediation', *Membrana – Journal of Photography, Theory and Visual Culture* 6, no. 1 (2021); Jo Coghlan, 'Dissent Dressing: The Colour and Fabric of Political Rage', *M/C Journal* 22, no. 1 (2019).

1980s. We examine how the introduction of hi-vis unfolded in the national context of Australia, a country where such garments are now ubiquitous, perhaps even more so than in comparable national settings.

Part of what drew our team to this topic was hi-vis' semantic flexibility: the 'work' hi-vis garments perform in society is not always obvious. This conceptual elasticity – simultaneously a tool of safety, identity, authority, and protest – makes it easy to overlook hi-vis' past. However, if we want to understand hi-vis' current meanings and functions, we must first come to grips with its emergence. Accordingly, we asked: when and where was hi-vis workwear first introduced in Australia? How was it received? Was its uptake initially driven by science, ideology, regulation, workplace culture? Was hi-vis a safety initiative led from the bottom up, or a managerial strategy that individualised safety responsibility? This article begins the process of answering these questions. Here we articulate the key factors influencing the *early* uptake of hi-vis, which included: practicality and thermal comfort, industry-specific risks, union advocacy, and the availability of suitable fabrics that could maintain fluorescence. Other contributing factors included shifting legal frameworks and attitudinal change regarding WHS, particularly in Australian public service departments.

In research of this kind, it is tempting to try to pinpoint a singular first use. Although we are not immune to this temptation, we caution against the simplicity of such historical narratives. However, we can say with some confidence that hi-vis *workwear* first emerged in Western contexts in the early to mid-1960s. Some of the earliest uses of (non-wartime) hi-vis – which our archival research has uncovered – can be traced to the early 1960s in West Germany.[5] Also around this period, the Texas Highway Department introduced bright garments for highway roadworkers, a workplace measure that the New South Wales Department of Main Roads (NSW DMR) watched closely (more on this further on).[6] In a better-known early example from the United Kingdom (UK), orange 'mini-vests' were issued to railway trackworkers in 1964.[7] (We return to these UK mini-vests later.)

In the early to mid-1960s, some Australian state public service departments were closely following overseas uses of hi-vis garments, alongside other safety visibility measures. From there, state departments in road construction and railways introduced hi-vis vests, and occasionally hi-vis jackets, from the mid-1960s. Uptake, however, was inconsistent across regions and sectors, shaped by the specifics of local industry risks, climate, garment availability, and state-based

[5] NSW State Archives, Kingswood, Sydney, DMR files, Interdepartmental Committee on Occupational Safety, NRS-9771-8-764M416, Part I. Note: This statement does not include mid-twentieth century 'life preserver' life jackets, which, while sometimes bright in colour, are not quite fluorescent and have a separate history.

[6] Ibid.

[7] Andrew Martin, *Belles and Whistles: Journeys Through Time on Britain's Trains* (London: Profile, 2014); Andrew Martin, 'Hi-Vis Vests Look Industrious and Life-Saving, No Wonder Politicians Love Them', *The Guardian,* 28 June 2014, https://www.theguardian.com/commentisfree/2014/jun/28/hi-vis-vests-politicians-love-them; Paul Almond and Mike Esbester, *Health & Safety in Contemporary Britain* (Cham: Springer, 2019).

legislation. The examples we share – primarily from railways and road construction in NSW, Victoria, South Australia, and Tasmania – reflect these variations.

In the remainder of this article, we begin by engaging with the existing scholarship on hi-vis clothing and, more broadly, on histories of artificial fluorescent pigments. We then outline our sources, before contextualising the study within Australian WHS practices and industrial workwear prior to the introduction of hi-vis. The second half of the article outlines the key factors shaping the early adoption of hi-vis in Australia, using two case studies from road construction and railways. Here we focus on how practicality, wearability, and industry-specific negotiations played out, from the 1960s to the 1980s. While we acknowledge the importance of later influences on hi-vis uptake (such as shifting cultural attitudes, Australian economic restructuring in the 1980s and 1990s, and its relationship to globalised textile production), these are treated here only briefly, toward the end of this article. Our focus is on the earlier, formative period, and the practical, legal, and workplace-level negotiations that drove the initial roll-out of hi-vis in industrial settings. The later dynamics will be the subject of future work.

Existing analyses of hi-vis

Hi-vis brings together safety, labour, and fashion, so it makes sense to take an interdisciplinary approach. Accordingly, in seeking secondary material, we engaged with design and fashion histories, studies of WHS, alongside labour histories.[8] Histories of uniforms have thus far not engaged closely with industrial workwear or the details of hi-vis, with very little mention in Craig Wilcox's 2017 history of Australian uniforms, nor in Heather Akou's 2024 history of the American equivalent.[9] The disciplines of cultural studies and visual culture feature some discussion of the cultural power of hi-vis in Australia.[10] This literature, however, tends to interpret hi-vis in specific gender-political frameworks, for example, viewing hi-vis as representative of a 'blokey' white masculine identity (we have found, however, that hi-vis wearers are very diverse in the contemporary period). Cultural theorist Anna Watkins-Fisher has critically interpreted the hue 'safety orange' as emblematic of the individualisation of risk, a neoliberal

[8] We also consulted scientific and psychological analyses, such as: Dorothy A. Curtis, 'High-Visibility Vests and Implicit Negative Stereotypes' (Master's thesis, Macquarie University, 2015); Rylan Simpson and Elise Sargeant, 'Exploring the Perceptual Effects of Uniforms and Accoutrements Among a Sample of Police Officers', *Policing* 16, no. 4 (2022): 663–75; Frank Schieber, 'Modelling the Appearance of Fluorescent Colours', *Proceedings of the Human Factors and Ergonomics Society Annual Meeting* 45, no. 18 (2001): 1324–7.

[9] Heather Akou, *On the Job: A History of American Work Uniforms* (London: Bloomsbury, 2024); Craig Wilcox, *Badge Boot Button: The Story of Australian Uniforms* (Canberra: National Library of Australia, 2017).

[10] Katrina Schlunke, 'The Object of Art in the Anthropocene: Generative Chairs and Hi-Vis Touches', *Australian Humanities Review* 63 (2018): 116; Joan Ross, 'Post Colonial Fluorescence' (Master's thesis, UNSW, Sydney, 2012).

performance of risk management, rather than genuine care.[11] While Watkins-Fisher's argument resonates in the US, our findings in relation to early Australian hi-vis suggests, to some extent, a genuine worker safety emphasis, as this article outlines.

Popular histories of hi-vis (e.g. the type you might find on a workwear retailer blog) typically begin with the invention of Day-Glo paint.[12] This is a reasonable starting point, and historian Carolyn Kane's design history of synthetic fluorescent colour provides a deeper grounding in this history, outlining nineteenth- and twentieth-century experiments with luminescent pigments.[13] As Kane notes, central to the development of synthetic pigments was their commercialisation in the US in the 1930s, famously led by American brothers Joseph and Robert Switzer – the creators of Day-Glo.[14] Artificial fluorescent pigments also found wartime uses in World War II (both sides), before expanding into mainstream commercial printing, fashion, and art-world usage in the US in the 1960s. In tandem with the development of artificial fluorescent pigments was the development of synthetic fabrics. This is significant for hi-vis, because natural fibres do not hold fluorescent colours well, and synthetic fabrics can more reliably maintain fluorescent brightness. Hi-vis would have never evolved into such mainstream usage without the mass production of synthetic pigments and synthetic and blended materials such as nylon, vinyl, polyester, acrylic, and, later, microfibres and other 'technical' fabrics.[15]

British railway historian Andrew Martin declared that: '"high-vis" clothing originated on the railways'.[16] He described how, in 1964, fifteen platelayers (trackworkers) on the British Rail (BR) Pollokshields to Eglinton Street line in Glasgow were issued with bright orange vests to enhance their visibility[17] (Figure 1). The vests were cropped and attached at the sides or front with buttons or Velcro. Some appeared more like a small waistcoat; other versions looked more like a sports training bib.[18] Legal scholar Paul Almond and historian Mike Esbester, who have comprehensively charted the history of modern British work health and safety, give these mid-1960s Scottish 'mini vests' brief attention.[19] Significantly, Almond and Esbester note that the introduction of orange vests by BR was initially optional, to avoid the perception of heavy-handed

[11] Anna Watkins Fisher, 'Safety Orange', *Journal of Visual Culture* 20, no. 1 (2021): 3–24; Fisher, *Safety Orange* (Minneapolis: University of Minnesota Press, 2021).
[12] For example: Josh Tulloch, 'The Invention of Hi Vis Workwear', *Big Branding*, 2021, https://bigbranding.com.au/2021/02/21/the-invention-of-hi-vis-workwear.
[13] Carolyn L. Kane, 'Synthetic Fluorescents: Day-Glo from Novelty to Norm', *Journal of Design History* 27, no. 3 (2014): 256–77.
[14] Ibid.
[15] Anneke Smelik, 'Polyester: A Cultural History', *Fashion Practice* 15, no. 2 (2023): 279–99.
[16] Martin, Belles & Whistles, 71.
[17] Ibid.
[18] Examples of these mini vests can be seen in the BR safety film by Peter Purves, *Railways: Robbie* (British Transport Films, 1979). Online: www.youtube.com/watch?v=WxXDw3WOGQs&ab_channel=PaulChilds.
[19] Almond and Esbester.

Figure 1 Science Museum Group, Hi-visibility vest, Science Museum Group Collection UK, Online #1983-7802 https://collection.sciencemuseumgroup.org.uk/objects/co220867/hi-visibilty-vest, Creative Commons Zero licence.

managerialism. Nonetheless, some BR staff resisted the vests, feeling 'over conspicuous' or concerned they would appear 'less brave'.[20]

Historian Bridget Hutter explains that 'BR provided safety equipment and safety clothing but these were not always used'.[21] Hutter argues that non-compliance was due to two factors: pragmatic practical reasons (e.g. bulky or uncomfortable); and inconvenience or habit, where 'small-scale lapses' such as 'just nipping across the tracks' or 'forgetting' to put on safety clothing.[22] To address these behaviours, in the late 1960s BR's Accident Prevention Service designed posters promoting the vests. In one, a woman in an orange bikini attracts attention to the garments (Figure 2). By the 1970s the vests were far more accepted by most BR staff.[23] This timing loosely aligns with the release of the 1972 *Robens Report*, the UK report into work health and safety that significantly influenced the development of UK and Australian WHS legislation (detailed further on).[24]

[20] Ibid., 275–6.
[21] Bridget M. Hutter, *Regulation and Risk* (Oxford: Oxford University Press, 2001), 257.
[22] Ibid., 258.
[23] Almond and Esbester, 276.
[24] Robens Committee, *Safety and Health at Work: Report of the Committee 1970–1972*, Cmnd 5034 (London: Her Majesty's Stationery Office, 1972). In the UK in the mid-1960s fluorescent vests were introduced to increase visibility for children walking to and from school. See: '"Diddy

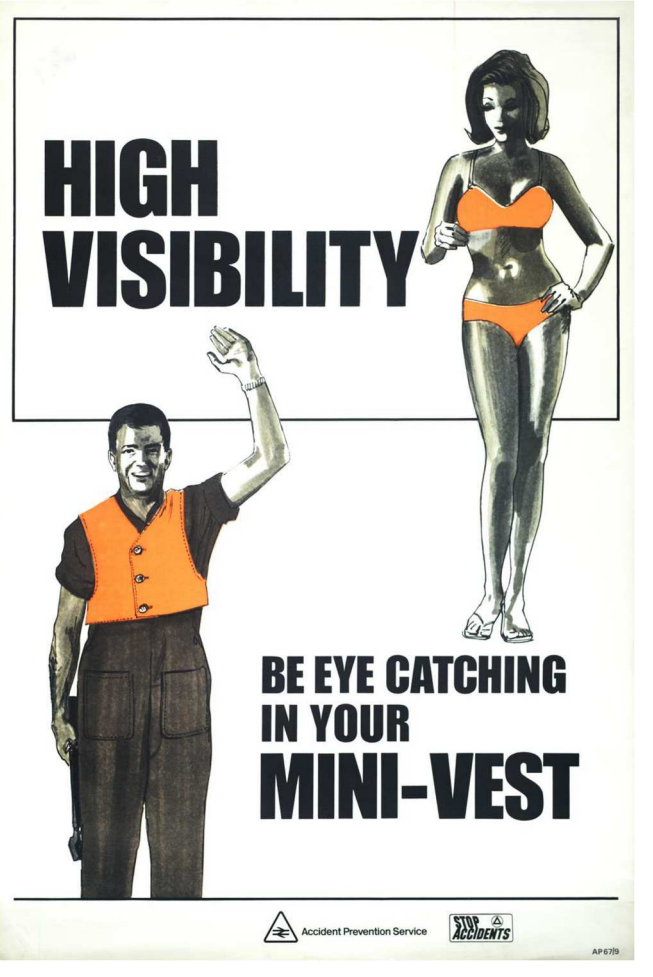

Figure 2. British Railways Accident Prevention Service, poster, Be eye catching in your mini-vest, 1967, Science Museum Group Collection online #2003-7607, https://collection.sciencemuseumgroup.org.uk/objects/co8027752/high-visibility-be-eye-catching-in-yourmini-vest, CC BY-NC-SA 4.0 licence.

While the work of Almond and Esbester (among others) provides a broad picture of WHS history in the UK, no comparable overarching history of WHS exists yet in Australia, although there are individual histories of sectors, unions, and accidents, and some of these provide insights into safety equipment.[25] For

Jackets" Were Issued To Thousands of Pupils', *Lancashire Telegraph*, 11 January 2003, https://www.lancashiretelegraph.co.uk/news/5924465.diddy-jackets-issued-go-thousands-pupils.

[25] Almond and Esbester; see also for the UK: Arthur McIvor, *Jobs and Bodies: An Oral History of Health and Safety in Britain* (London: Bloomsbury, 2023). Australian examples: Lenore Layman, 'The

example, the historian Humphrey McQueen has charted Australian union demands for safety helmets in the construction sector.[26] McQueen traced the use of various types of hard-hats, noting that well into the 1960s helmets 'remained compulsory only over certain heights but were not always worn, even around the tallest towers'.[27] McQueen explained:

> Despite the endorsement of safety helmets by public authorities and some unions, the construction industry took nearly twenty years before wearing them became universal. The building unions had to pressure authorities, battle employers and educate their own members [to wear helmets].[28]

As with our findings with hi-vis workwear, McQueen's conclusions on hard hats are that usage differed across employers, industries, and worksites, and even when a helmet measure was in place, this did not necessarily mean that one was provided by the employer, nor that workers always complied. As McQueen charts, practical issues also played a significant part: comfort, wearability, materials, and fit all played an influential role in increasing worker uptake of PPE. This chimes with our own findings (detailed further on).

Methods and sources

Owing to the paucity of secondary sources, our aim was to find primary records regarding the introduction of high-visibility workwear in Australian workplaces, or at least tracing evidence of hi-vis usage over time. Three archives were of most use: 1) the NSW State Archives, particularly their NSW DMR materials from the 1960s and 1970s; 2) the National Archives of Australia's records of the Australian National Railways Commission (AN) from the late 1970s and early 1980s; and, 3) covering the same period and industry from a union perspective, the papers of the Australian Railways Union held in the Noel Butlin Archives Centre, Canberra. This archival material was supplemented with archival photographic analysis, particularly close examination of the historical image collections held by Transport for NSW, among other collections.[29] Thousands of photographs from road construction sites were reviewed. This process developed our understanding of how hi-vis clothing shifted into common usage at roadworks sites, and when it began to appear on the backs of politicians. From the Transport for NSW Collection it is also possible to discern what road workers tended to wear immediately before hi-vis was mainstay workwear (Figure 3). This visual evidence helped to visually 'flesh out' our archival findings from DMR materials.

Study of Occupational Health in Australia', *Labour History* no. 52 (1987): 1–14; Michael Quinlan, 'Precarious and Hazardous Work: The Health and Safety of Merchant Seamen 1815–1935', *Social History* 38, no. 3 (2013): 281–307.

[26] Humphrey McQueen, *Framework of Flesh: Builders' Labourers Battle for Health and Safety* (Adelaide: Ginninderra, 2009).

[27] Ibid., 61.

[28] Ibid., 62.

[29] Transport for NSW, Historic Assets Library, NSW Government, online: https://historiclibrary.transport.nsw.gov.au/.

Figure 3. Australian workwear before hi-vis: DMR roadworkers at F4 Western Freeway Concreting Operations, between Granville and Parramatta, 1986, Department of Main Roads NSW, Transport for NSW historical image asset, file no #F4 DH 4 86 N15, State of New South Wales (Transport for NSW). Creative Commons Attribution 4.0 licence.

Artefact-based analysis has given our research further depth. Our hi-vis project is partnered with the Powerhouse, Sydney, and we were able to conduct a close garment study of two 1975 hi-vis vests designed for Australia Post delivery motorcyclists, which aided in our understanding of the heat, materials, and fit issues at play with early uses of hi-vis (detailed later) (Figure 4).

Background: Broader work health and safety context

To contextualise the introduction of hi-vis, it is important to consider what Australian industrial workers wore *before* hi-vis. Mid-to-late twentieth century industrial workwear typically featured heavy-duty cotton overalls or boilersuits in navy, white, or grey, with some of the most common brands being King-Gee, Hard Yakka, and, later, Bisley. In warmer months, where allowed, workers wore very little: it was common to see short shorts (named 'Stubbies' after the shorts

Figure 4. 98/2/63-2 Safety vest, part of motorbike postman uniform, plastic / metal, designed by Australia Post, made by Safe Sport, Australia, c. 1975–1984. Powerhouse Museum Collection. Gift of Australia Post, NSW Headquarters, 1998. Photographed alongside 87/1038D Safety vest, plastic, by MSA (Australia) Pty Ltd, Australia, 1987. Powerhouse Museum Collection. Purchased 1987. Photograph by Ryan Hernandez, reproduced with permission.

brand), heavy boots (typically steel-capped Blundstones) and no shirt, or a sleeveless singlet (sometimes known as a 'Jackie Howe'). As seen in Figure 3 (from 1986), emerging skin-cancer awareness in the 1980s did not translate to workwear in hot weather.

From the mid-twentieth century, the story of WHS in Australia has been one of profound attitudinal, social, and legal transformation. Once relegated to the margins of industrial life – where accidents were often dismissed as inevitable and risk-taking was valorised, especially among working-class men – safety has gradually become a central concern in both policy and practice. Safety was once seen as the domain of personal experience, rather than formal expertise, and workers were respected for being 'skilled enough' to take risks, or valorised for supposedly needing less safety equipment.[30] As historian Arthur McIvor has observed of the UK, such cultural norms meant that 'risk taking was commonplace and helped to sustain and bolster working-class masculinity'[31] – often with devastating consequences. In the UK, tragedies such as the Aberfan disaster in 1966 and the 1968 fire at A.J. & S. Stern's furniture factory exposed the lethal costs of inadequate regulation and managerial neglect, galvanising public and

[30] John Shields, 'Craftsmen in the Making: the Memory and Meaning of Apprenticeship in Sydney between the Great War and the Great Depression', in *All Our Labours*, ed. John Shields (Sydney: NSW University Press, 1992): 86–122; Jesse Adams Stein, *Hot Metal* (Manchester: Manchester University Press, 2016).

[31] Arthur McIvor, *Jobs and Bodies: An Oral History of Health and Safety in Britain* (London: Bloomsbury, 2024), 21.

political will toward reform.[32] Likewise in Australia, the 1970 West Gate Bridge disaster, the 1972 Ipswich Box Flat Colliery gas explosion, and the 1977 Granville Rail disaster all pointed to urgent need for improved safety standards and enforcement for workers and the public in general.[33] As Almond and Esbester note, by the late twentieth century, WHS had shifted 'from a marginal concern to a central feature of policy and society'.[34]

This cultural shift in popular attitudes towards safety paralleled, and was reinforced by, significant legal reforms. The 1972 *Robens Review* in the UK was a turning point,[35] leading to the *Health and Safety at Work Act 1974* (UK), which placed responsibility for safety on both employers and employees, requiring cooperation between labour and capital. South Australia introduced comparable reforms under Premier Don Dunstan as early as 1974 (discussed further below), which rapidly spread to other Australian jurisdictions.[36] Trade unions played a significant role in pushing these changes, reframing safety not as an individual burden but as a collective right, and working slowly to overturn masculinist ideals that equated protective equipment with male weakness. By the 1980s and 1990s, formal WHS roles were increasingly legitimised and professionalised, though inconsistently, reflecting a cultural transition from informal, experience-based safety knowledge to structured, enforceable safety standards.[37] The increasing use of hi-vis is part of this broader attitudinal and legal transformation in WHS awareness and practices. It is important, however, not to view WHS legislation as simply a process of parties 'seeing the light' regarding workers' health and wellbeing, as it has equally been driven by corporations and insurers to manage liability for injuries and death.[38]

Industry specificity

The history of hi-vis workwear in Australia is highly industry specific, with its adoption occurring unevenly across sectors such as road transport, aviation,

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[32] Belinda Liversedge, 'How Robens Super-Charged the Safety System', British Safety Council, 16 May 2022. Online: www.britsafe.org/safety-management/2022/how-robens-super-charged-the-safety-system.

[33] Sarah Gregson and Elizabeth Humphrys, 'The West Gate Bridge Collapse: How Disaster Happens', in *The Regulation and Management of Workplace Health and Safety* (London: Routledge, 2020): 32–51.

[34] Almond and Esbester, 194.

[35] Robens et al.

[36] *1974 Construction Safety Regulation (Reg 204A), South Australia Industrial Safety, Health and Welfare Act 1972–1976*, South Australian Government. While worker representation became a widespread factor in post-Robens WHS legislation, there is one example of worker representation that predates this era by a long margin. Statutory worker representation existed in UK and Australian mining since the 1870s. See David Walters and Michael Quinlan, 'Representing Workers on Occupational Safety and Health: Some Lessons from a Largely Ignored History', *Industrial Relations Journal* 50, no. 4 (2019): 399–414. https://doi.org/10.1111/irj.12268.

[37] David J. Provan and Pam Pryor, 'The Emergence of the Occupational Health and Safety Profession in Australia', *Safety Science* 117 (2019): 428–36.

[38] Nate Holdren, *Injury Impoverished: Workplace Accidents, Capitalism, and Law in the Progressive Era* (Cambridge: Cambridge University Press, 2020).

rail, and construction. Broadly, hi-vis appeared first in outdoor, high-traffic environments, while indoor workplaces such as logistics warehouses, manufacturing, and domestic building construction adopted it much later. Among non-traditional or informal workers (such as bicycle couriers and delivery riders), usage remained inconsistent until regulatory intervention in the 2020s.[39] This patchy rollout means that workplace-level negotiations and trials often shaped how and when hi-vis garments were adopted.

The literal *form* that hi-vis garments took was also industry specific, as can be seen in the previously mentioned Australia Post hi-vis vests (dating to 1975–84), now held in the Powerhouse collection. As seen in Figure 4, these vests are made of rigid, heavy plastic mesh: certainly uncomfortable to wear, but designed specifically with motorcycle 'posties' in mind. The triangular shape of the front panels of the vest – combined with the thin stripe of yellow retroreflective tape diagonally down the front – appear to be designed with consideration of how a motorcycle rider appears on a motorbike. Similarly, the standard Vic Roads hi-vis vest is long at the back: specifically designed for workers bending over to remain visible. Bodies are a key part of this story, as unpacked in the case study below.

Practicality and wearability

Even from its earliest uses, the central factors shaping the uptake of hi-vis workwear were deeply practical, centred around thermal comfort, durability, wearability, and ease of laundering. As the following two examples demonstrate, practical considerations had a significant impact upon whether state departments decided to invest in hi-vis, and upon whether workers actually wore the garments. In the early years of hi-vis, petrochemical plastic-based fabrics (i.e. materials which held fluorescent pigments well), were not often comfortable or breathable for workwear. In the Australian climate, heat was a significant consideration, as was waterproof fabric (which for many years was restricted to PVC plastic – not exactly comfortable all-day wear).

Case 1: NSW Department of Main Roads

The NSW Department of Main Roads was a state government department tasked with road building and maintenance for main roads, infrastructure, bridges, and highways across NSW. As early as 1962, the NSW Department of Main Roads sent officer N.F. Hatcher to the US and Europe to research safety measures undertaken on highways and roads. This trip resulted in enhanced understandings of retroreflective materials. Shared in Hatcher's travel

[39] For example, the NSW Road Rules changed in 2023: 'food delivery booking providers are legally required to supply a food delivery rider with high-visibility personal protective equipment, including a retro-reflective outer clothing item (such as a vest) and a bag or container'. – Transport for NSW, 'Food Delivery Riders – Increasing visibility on our roads' (NSW Government, 2022).

records is a photograph of a West German road safety inspector wearing a thin retro-reflective belt on top of his suit.[40] On this same trip, Hatcher returned from the US enthused about the Texas Highway Department's safety measures:

> From discussion with State Highway Officials and from an examination of employee accident statistics it is evident that the employment of an engineer officer whose special task is the promotion of employee safety has been well worthwhile, not only in creating a 'safety consciousness' in the employees themselves, but in developing methods and procedures which provide safer conditions for the road user. … I particularly have in mind the development of conspicuous clothing for use by flagmen.[41]

At the time, the Texas Highway Department had a solid reputation for its traffic safety program, which had been rolled out since at least the early 1950s.[42]

It took some years to action this at the NSW DMR, but certainly by 1967, 'flagmen' roadworkers at the DMR were using orange vinyl vests at Traffic Works in Progress. The DMR's *Circular No. C789* instructed that at Works in Progress near live traffic 'Flagmen Ahead' signs must be used, flagmen must use STOP/SLOW ('lollipop') signs, and wear high-visibility vests and armbands.[43] At this stage, it was *only* the flagman – placed at either end of the works site, closest to moving traffic – who was deemed to need high-visibility garb, not other roadworkers. The vinyl vests first adopted by the DMR were modelled on those from the Texas Highway Department, supplied by Duffy Electronics in Caringbah, NSW, at a cost of AUD $1.55 each for an order of 250.[44] The vests did not seem particularly durable or colour-fast, given that the DMR estimated that the life of a vest of this kind was '7–9 months'.[45] DMR records from 1968 indicate that the Australian Workers Union (AWU) supported the use of vests, however in the first years of the roll-out, there were some complaints from workers, 'particularly from the more humid areas', finding the vests uncomfortably hot.[46] These complaints led the DMR to conduct a series of tests on various types of orange vests and jackets.[47]

The DMR's tests of high-visibility vests and jackets – undertaken between 1968 and 1969 – reveal a great deal about the different practical considerations that were central to how the roll-out of hi-vis evolved. The new vests being tested at the DMR were not made of vinyl but of fibreglass mesh. While this

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[40] NSW State Archives, DMR files, Interdepartmental Committee on Occupational Safety, NRS-9771-8-764M416, Part I.
[41] Ibid.
[42] 'Texas Safety Traffic Control Programme', *Construction*, 16 April 1952, 4.
[43] NSW State Archives, DMR files, Control of Traffic works in progress, NRS-9771-7-26-53M249. 'Flagmen' are the workers who stand at each end of a road worksite, adjacent to live traffic, typically holding a 'STOP/SLOW' sign, alerting drivers about the worksite.
[44] Ibid.
[45] Ibid.
[46] Ibid.
[47] Ibid.

material may horrify contemporary readers, some of those testing the vests had more favourable views. A DMR Traffic Works team in Granville, NSW, reported on a two-month test of the orange fibreglass vests in 1969:

> The fibreglass mesh vests supplied … have been found to be as visible as the standard vest, and more visible in failing light. … Personnel … have commented that the vests are considerably cooler than the standard type. … Wearers of the vests also commented favourably on the appearance compared to the standard vest, and feel less self-conscious while wearing them. This is an important factor in encouraging the use of the vests.[48]

Other teams concurrently testing the vests similarly reported the fibreglass vests were 'light, cool to wear', 'may be much better in hot weather' and that 'the new vests are cool and quite comfortable', but that they 'tend to ride up at the back of the wearer if he bends over'.[49]

Not all those testing the vests agreed that the new vests were as good as the Texas vinyl type, however, with the Works Engineer G.P. Leader complaining in June 1969 that 'after four weeks use the colour appears to have faded noticeably', and 'the "cardigan" or "jumper" like texture of the vests does not snatch the attention of the motorist as much as the usual vest design'. Leader further complained that 'the "pink" colour of the vests does not "stand out" as much as the bright orange colour of the existing high visibility vests'.[50] Further tests were undertaken in 1969 with high-visibility fibreglass mesh jackets, finding that the jackets provided better ventilation for wearers. The sample jackets provided were from NB & L Trading Co., a small business based in Annandale NSW, and cost AUD$3.18 each.

Amid the everyday detail in the DMR records concerning Traffic Works in Progress in the late 1960s, it is clear that considerations of supplier availability, cost, colour-fastness, durability, and thermal comfort were all major concerns. We did not find evidence that workers resisted wearing the garments in great numbers; however, there are some examples of non-compliance. For example, in 1971 internal DMR memos directed to a Divisional Works Engineer from Tamworth noted that 'red coloured vests were not being worn by employees working in close proximity to traffic' and that supervisors 'should ensure that the protective measures' are being followed.[51]

Unfortunately, the DMR records do not contain garment samples; however, the Transport for NSW historical images include photographs from 1969 of a roadworks site at Snowy Mountains Highway at Brown Mountain (Figure 5). As indicated in Figure 5, the flagman at the front of the roadworks site stands with a 'lollipop' sign, and wears an orange vest. There are multiple versions of this image, and one indicates that the back of the vest features a large 'X' in

[48] Ibid.
[49] Ibid.
[50] Ibid.
[51] Ibid.

Figure 5. DMR Roadworkers Workers at Snowy Mountains Highway worksite at Brown Mountain, 1969, (cropped). Transport for NSW historical image asset, file no #P03383-13, Box 114, State of New South Wales (Transport for NSW). Creative Commons Attribution 4.0 licence.

orange, contrasted against a grey background, while the front is orange with a V-neck. The image is high quality, and zooming in reveals that the vest looks to be made of an incredibly shiny plastic material (possibly vinyl), and does not appear to drape, but rather sticks out awkwardly from the sides of the wearer, suggesting semi-rigid plastic. The flagman does not wear a hat, and the other road-workers in the image are not wearing hi-vis. A later photograph of a flagman taken in 1973 at the Hume Highway near Mittagong indicates a side-view of what is possibly the same type of vest (Figure 6). The vest appears to be quite 'airy' around the armpits, as it fastens on the sides with cord or string. It is likely that this vest is the vinyl type, as the material appears rigid and not mesh-like.

Figure 6. DMR roadworks 'flagman' in orange vest at Hume Highway near Mittagong, 1973, Transport for NSW historical image asset, Box 134, State of New South Wales (Transport for NSW). Creative Commons Attribution 4.0 licence.

According to our examination of DMR archival photographs, by the late 1980s roadworkers increasingly wore hi-vis vests, although use appears inconsistent until at least the mid-1990s. In the mid-1980s, commonly used hi-vis at DMR was an orangey-red vest with white piping on the edges and the DMR logo on the left-hand breast. The vest appears to be one-size and used Velcro fasteners, and workers wore it sealed or open. When the DMR became the RTA (Roads and Traffic Authority) this type of vest was continued, albeit with a different logo (Figure 7). This vest would likely not pass safety standards today, as the colour is almost red (like a Santa suit), not a luminous fluorescent orange.

Case 2: Australian National Railways Commission

The Australian National Railways Commission (AN) – specifically in South Australia (SA) and Tasmania – were slower to introduce hi-vis vests than some of their state rail counterparts, such as NSW State Rail and Victoria Rail (VicRail). Some background to AN is helpful in interpreting this context. AN

Figure 7. RTA workers, Bituminous Sealing Test Operations in Goulburn, NSW, 1992, Transport for NSW historical image asset, file no # P02137-23, Box 036, State of New South Wales (Transport for NSW). Creative Commons Attribution 4.0 licence.

was an initiative of the Whitlam government, an election promise in 1972 that attempted to nationalise the non-metropolitan railway system across Australia.[52] After the Whitlam dismissal in 1975, AN took over operations of the Commonwealth Railway Department. Ultimately only SA and Tasmania joined AN in 1978, and it was never a fully national body. Prime Minister Malcolm Fraser,

[52] Philip Laird, 'Railways in Australia: Federation Unfulfilled', The Henry Parkes Oration, 2011, Henry Parkes Foundation, https://parkesfoundation.org.au/wp-content/uploads/2014/01/hporation2011.pdf; Malcolm Abbott and Bruce Cohen, 'Transport: A New Way Forward', in *Monopoly Control: Government Ownership and Control of Network Utility Industries in Australia from 1788 to 1988* (Singapore: Springer, 2023), 321–34.

once he took office in 1975, directed AN to eliminate deficits.[53] Fraser-era records from AN (1978–83) demonstrate how AN edged slowly toward the introduction of hi-vis vests in SA and Tasmania, but the process was impeded by austerity, slow bureaucracy, and challenging decision-making regarding which garments to introduce.

In 1977 the Australian Federated Union of Locomotive Enginemen (AFULE) raised concerns with (what was then) SA Rail about the visibility of workers tasked with signalling during shunting operations, particularly when shunting long trains. Prior to joining AN, SA Rail's Committee on Safety Vests issued detailed recommendations for the provision and type of hi-vis vests for railway shunters in 1977. These recommendations were in the possession of AN's later formed Safety Committee, and included instructions such as:

> The colour chosen should not be confused with red or green … . Clothing must be neat fitting, preferably with a stretch capacity, NO straps etc., to get caught up … . Plastic type garments are too hot in many circumstances … . Clothing must be washable and non-fade … . The colour should be ORANGE as in the fruit orange … no loose or sloppy parts … vests should be personal issue. It should be patterned on a 'waistcoat' style with Velcro fasteners … all … vests should have yellow reflective tape sewn on before issue.[54]

This committee had very clear practical requirements about which vests to introduce. It appears AN's Safety Committee took up the issue as early as 1978, acting on concern that 'a number of near misses … have been reported', but progress was protracted.[55] The issue of worker visibility became especially problematic in relation to AN's new brown uniforms (introduced 1978), which 'made workers blend in with the background'.[56] AN management hesitated, worried that providing hi-vis jackets to AN shunting crews might 'lead to union pressure for a general issue to all permanent way staff', which presumably might involve considerable expenditure.[57]

In addition to concerns about costs, practical questions of laundering, thermal comfort, and water-resistance were also discussed at some length within AN. By early 1980 AN still had not consistently introduced hi-vis garments for its workers, although trials were undertaken. One of the issues plaguing decision-making was a desire for a silver bullet: what kind of single garment would reliably be worn by workers as an outer layer in both heatwaves

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[53] Peter Donovan and Bernard O'Neil, *The Long Haul: Australian National 1978–1988* (Sydney: Focus Books, 1992).

[54] Committee on Safety Vests, 'Use of high visibility clothing', SA Rail, 1977, record from Australian National Railways Commission (AN) records, National Archives of Australia (NAA), NAA: D1737, 1980/19. Caps in the original.

[55] Letter from W Francis, Senior Safety Officer, AN (Adelaide), to Chairman AN Safety Council (Norwich Centre), 'Use of high visibility clothing', 17 December 1979, NAA: D1737, 1980/19.

[56] Ibid.

[57] Letter from AN Chief Civil Engineer to AN Assistant General Manager (Administration), 23 January 1980, NAA: D1737, 1980/19.

in SA and icy wet weather in Tasmania? For example, in 1980 AN's Chief Mechanical Engineer noted that 'in hot weather, coats are often disposed of' and 'in wet weather [vests] would be concealed by overcoats'.[58] There was no agreement on the type of high-visibility garments (or hand-held high-visibility equipment); the records contain discussions of orange jackets, overalls, white 'oversleeves', or bright plastic hand-held sheets, as well as vests.[59]

By March 1980, AN investigations were undertaken into suppliers of vests, leading to a delightful record in the archives. It features a telephone memo noting that a company called Normack Clothing had called AN, leaving a message promoting their hi-vis vests. The note reads: 'Knitted light fabric – like singlet material in bright pink. Someone could take a look, and they do handle large orders'.[60] Handwritten next to the memo is the response, 'Fettlers in pink!?' and below, in the same handwriting, 'what do aircraft carrier batmen use in the tropics?' again indicating that thermal comfort – alongside maintaining hegemonic masculinities – were key concerns.[61] We return to the issue of masculinities further on.

Another hi-vis supplier, Tootal, based in Tasmania, also advertised its products to AN. AN records include a promotional letter from Tootal (from 1980), boasting that they already supply hi-vis to NSW Rail, and supply a 'vest-like overgarment' that is

> … lightweight, cool and comfortable, easily launderable, quick drying, fast to light fading [*sic*], durable to wear and water-repelling … and 100% Polyester. The Yellow Orange is to the British Standard.[62]

Tootal claimed that their main competitors use nylon vests, which are not water repellent, and have less visibility in low light, compared to their 'superior' polyester fabric with an oil/water repellent finish. Tootal's description highlights how significant such practical factors were in decision-making about whether workers should wear hi-vis vests – particularly from the late 1960s to the early 1980s. The orange hue was one point of discussion. Was it too red? Was it not bright enough? Tootal's vests were apparently accepted by NSW Rail as being an appropriate orange, but was 'slightly lighter' than the VicRail orange.[63]

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[58] Letter from AN Chief Mechanical Engineer to Assistant General Manager (Administration), 'Safety', 24 January 1980, AN Records, NAA: D1737, 1980/19.

[59] For example: Letter from AN Operations Manager (Northern Region) to AN Chief Operations Manager, 'Use of High Visibility Clothing', 11 February 1980, in AN Records, NAA: D1737, 1980/19.

[60] AN Telephone memo, 'Normack Clothing', 3 March 1980, in AN Records, NAA: D1737, 1980/19.

[61] Ibid. At this stage – given the gendered make-up of Australia's industrial workforce, hi-vis was only imagined to be worn by male industrial workers. It has taken a long time for this gendered perception of hi-vis to shift – and arguably there is still some way to go. This is a topic we will address at length in other future publications.

[62] Tootal, 'Hi-Visibility', Promotional letter sent to AN, 26 May 1980, AN Records, NAA: D1737, 1980/19.

[63] Letter from AN Senior Safety Officer (Adelaide) to AN Personnel Manager (Norwich) and Assistant General Manager (Administration), 'High Visibility Clothing', 30 May 1980, AN Records, NAA: D1737, 1980/19.

This type of painstaking detail is peppered throughout AN safety files during this period. Progress was slow, and limited to small trials. Internal memos from 1980 reflect the piecemeal nature of implementation: '100 jackets should be ordered for trial in the Civil Engineering Branch', reads one memo, while another suggested vests might be 'loaned' to 'look-out men' only, to limit uptake.[64] Also in 1980, the Operations Manager of AN Central Region appeared to be concerned about extra work, wondering how he might ensure compliance: 'the unfortunate aspect of providing this type of apparel is ensuring that the staff use … the clothing provided'.[65] The debate continued into 1981, with hi-vis *shirts* receiving a first mention (they were not favoured). Safety was being negotiated, almost literally, one jacket or vest at a time. Meanwhile, fatality rates were not lowering. Between the years 1978 to 1985, level crossings remained problematic, with an average of five fatalities annually (workers and the public) at AN level crossings in those years.[66]

This case shows how improvements in workplace safety were shaped not only by risk, but also by institutional bureaucracy, practical concerns, industry specificity, economic restraint, and nascent understandings of workplace safety. By 1981, two unions were involved in requests for some form of visibility equipment to be used for shunting operators. The Australian Railways Union (ARU) wrote to AN that year, urgently requesting that some form of high-visibility signalling equipment be provided to shunting staff at Mile End, echoing the AFULE request from five years before.[67]

It was not until April 1987 that the AN's 'Safeworking Rules' were revised and introduced onto AN mainland tracks. These rules included hi-vis clothing for 'track forces' and luminous panels on railcars.[68] However, there remained significant practical problems, and these were raised at a 1988 meeting between the ARU and AN. The ARU raised concerns that the orange colour of the vests was too close to red, raising the risk that some locomotive drivers might mistake it for a red signal flag.[69] By September 1988, at an AN Safety Council Meeting, the Port Pirie and Gladstone gangs (AN South Australia) noted that 'high visibility vests considered unsafe, cottonvests [*sic*] hang loosely, Acrylic vests not fireproof and melt'.[70] By November, ARU officials continued to complain to AN that the vests were 'too tight, don't fit' and, more concerningly, had a 'low flashpoint', which was a significant fire risk for those engaged in welding.[71] To counter the

[64] Variety of letters and memos included in AN Records, NAA: D1737, 1980/19.
[65] Ibid.
[66] Donovan and O'Neil, 169.
[67] Letter from LH Fergusson (ARU organiser) to C. Schaumloffel, Acting AN Operations Manager (Central Region), 14 April 1981, Noel Butlin Archives Centre (NBAC), Australian Railways Union (ARU) Train Safety Files, Z359 73.
[68] Donovan and O'Neil, 170.
[69] File Note, re: Safety Council Meeting on 24 February 1988, meeting between ARU and AN, 16 March 1988, NBAC, ARU Train safety files, Z359 135.
[70] Safety Meeting minutes, meeting between ARU and AN, 19 September 1988, in Ibid.
[71] Safety Meeting minutes, meeting between ARU and AN, 10 November 1988, NBAC, ARU Train Safety Files Z359 129.

tight-fitting vests, workers were cutting their vests themselves, which was, in turn, added to the risks of being caught on machinery or catching fire.[72] The practical requirements for vests accordingly became more complex: they must be breathable, colourfast, not conflict with railway colours, fit over workwear but not be too loose, and have some fire-retardant capacity. Getting this balance right was difficult, though it appears some public agencies were further ahead than AN in this respect (e.g. VicRoads, VicRail, NSW Rail).

It should be noted that later scientific developments in acrylic fabrics, microfibres, and other synthetic materials in the late twentieth and early twenty-first centuries have shifted the dial on comfort and fire safety in high-visibility garments.[73] During the mid-to-late twentieth century, one of the chief limitations in the use of fluorescent-coloured materials for safety has been their tendency to quickly fade with laundering and sun-exposure, rendering them swiftly less safe and not-compliant with safety standards. Additionally, flame-retardant finishes and materials have in more recent years substantially reduced the fire-risk of synthetic hi-vis garments. But these developments are generally twenty-first century phenomena, and hi-vis procurers in the twentieth century did not have the benefit of this level of variety or quality, particularly if they were seeking to keep costs low.

Regulatory, legal frameworks and compliance with ISO standards

As noted earlier, the legal and regulatory environment that enabled and shaped the adoption of high-visibility workwear in Australia was, from the outset, heavily influenced by developments in the UK. Central to this was the aforementioned 1972 *Robens Review*, which catalysed the landmark UK *Health and Safety at Work Act 1974*.[74] This Act introduced the principle of shared responsibility between employers and workers and the now-standard 'so far as is reasonably practicable' clause. While Australia did not adopt a single national WHS legal framework until 2011, state-based legislation closely tracked UK models throughout the 1970s and 1980s.[75] One of the most notable early examples comes from South Australia, where the *Industrial Safety, Health and Welfare Act 1972–1976* and its *1974 Construction Safety Regulation (Reg 204A)* made explicit reference to high-visibility apparel. The regulation states:

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[72] Ibid.

[73] It was not until around 2001 that scientific breakthroughs in colourfast pigments transformed the durability of synthetic hi-visibility garments, leading to pigments that maintain their vivid colouration (and thus safety efficacy) for seven to ten years under normal sun-exposure and laundering. This is one factor that contributed to hi-vis' rising popularity in the first two decades of the twenty-first century. Once the problem of rapid colour-fade had been solved, high-visibility workwear held more perceived reliability as a safety measure. See Schieber, 'Modelling the Appearance of Fluorescent Colours'.

[74] Robens et al.

[75] Lindie Clark, 'The Politics of Regulation: A Comparative-Historical Study of Occupational Health and Safety Regulation', *Australian Journal of Public Administration* 58, no. 2 (1999): 94–104.

> If any person on construction work is required to work on or near a road amongst moving traffic, the employer … shall supply that person with suitable road safety apparel and that person shall … while so engaged, wear such apparel. … made of material which … has a fast, conspicuous and fluorescent colour, is of low flammability, and does not inhibit, as far as is practicable, natural ventilation. … maintained clean and in good repair by the employer.[76]

The case of AN – outlined in the previous section – demonstrates that adherence to the spirit of this regulation was patchy in practice. That said, the Regulation specifically refers to 'a road', not railways, and so in that sense AN was not in direct contravention, except as it concerned railway workers near level crossings. This distinction (between road and railway workers) is clearly absurd in terms of actual risk, as moving trains are as dangerous as moving traffic, if not more so. But it is this kind of legal distinction that was at play in the slow roll-out of hi-vis across a full railway workforce.

In parallel with these legislative frameworks, technical standardisation – particularly via British and later international ISO standards – played a growing role in determining the form and function of hi-vis garments. In 1970, the British Standards Institution introduced *BS4610: Specifications for Colours for High-Visibility Clothing*, which provided guidance on specific hues, luminescence factors, minimum chroma values, and colourfastness with laundering. This particular standard does not dictate a style or form to the garments (while later standards are far more specific), but distinguishes between all-day/long-term garments and ones intended for brief use. Australia did not develop its own comprehensive high-visibility clothing standards until the late 1990s. Prior to this, the UK and European standards were loosely followed. By the late 1990s, Australian/New Zealand standards began to emerge, such as *AS/NZS 1906.4:1997* (for retro-reflective materials) and *AS/NZS 4602:1999* (for high-visibility safety garments).[77] These standards specifically codified requirements for day-use, night-use, and day/night garments, with retro-reflective tape becoming mandatory for certain categories.

Retroreflective tape – the silver or yellow stripes on hi-vis that reflect light in dark conditions – was understood, even from the 1960s, to be a vital part of making a hi-vis garment visible in low-light or night conditions. The inclusion of retroreflective tape in the standards was a significant factor for hi-vis designers and manufacturers. For much of the twentieth century, the US company 3M held a virtual monopoly over retroreflective materials (tape included) and maintained strict licensing of its tape. The effect of this was to make the retroreflective

[76] *1974 Construction Safety Regulation (Reg 204A), South Australia Industrial Safety, Health and Welfare Act 1972–1976*.

[77] Full titles of those earlier Australian and New Zealand Standards are: AS/NZS 1906.4:1997: *Retro-reflective materials and devices for road traffic control purposes - High visibility materials for safety garments*; AS/NZS 4602:1999: *High visibility safety garments*.

tape expensive to procure, while its thickness also added further complications in sewing onto vests.[78]

The national harmonisation of state-based Australian WHS legislation in 2011 under the Gillard government further consolidated Australian regulatory requirements for employer provision of appropriate PPE. The post-national harmonisation model of WHS laws broadened the key definitions from 'employee' to 'worker' (including contractors), and 'employer' was replaced with the much wider term 'persons conducting a business or undertaking' (PCBU). This broadened the base of responsibility – meaning that a much larger group of organisations had to pay attention to safety measures. In effect, this made adherence to hi-vis AS/NZS standards a de-facto (but unstated) requirement in many sectors (with employers and PCBUs judging that if they used hi-vis, they could be judged to be doing the 'right thing' when accidents did occur and this might minimise liability).[79] Although relatively low on the hierarchy of controls for preventing workplace harm, high-visibility clothing offers employers a visible marker of their commitment to maintaining a safe work environment. Additionally, the tax-deductibility of PPE made such clothing economically neutral. Essentially, the growth of hi-vis workwear cannot be understood without reference to both the legislative frameworks and technical standards, as well as employer risk management.

Other contributing factors: Cultural and political-economic factors

The social and cultural dimensions of high-visibility (hi-vis) clothing in Australia warrant deeper exploration in future research (currently in train, no pun intended). However, we include a brief section here that contextualises the other contributing factors in hi-vis uptake in the twentieth and early twenty-first centuries: changing cultural attitudes to hi-vis; and the political-economic transformations to Australia's economy (including the flow-on impacts for local garment manufacturing).

Changing social acceptance of hi-vis

As we saw earlier with analysis by Almond and Esbester in the UK context, early resistance to hi-vis garments was shaped by gendered perceptions, with concerns about conspicuousness, embarrassment, and challenges to masculine norms.[80] While this resistance was ultimately short-lived, it did form part of the initial cultural reaction to the garments' introduction. In Australia, based on the records we have assessed to date, we can discern similar patterns, albeit noting less

[78] These insights are gleaned from our early interviews with hi-vis manufacturers and retailers (respectively), Steven Hanlon and Andrew Panther, 2025. UTS Human Ethics Approval #UTS ETH24-10187.
[79] Ibid.
[80] Almond and Esbester, 275–6.

worker resistance. Archival records suggest that between the late 1960s and the 1980s, some workers failed to wear hi-vis when it was provided. However, thus far we found little evidence of formal objections specifically based on masculinity or concerns about conspicuousness. This is not to say that such feelings were not felt, but that worker complaints about hi-vis made to employers or unions (available in archival and related sources) tended to focus on practical and safety concerns and physical discomfort, rather than on symbolic, identity-based, or ideological factors. Raewyn Connell argued in *Gender and Power* for a structural understanding of how *hegemonic masculinity* operates at the level of the whole society. Although differences (tied to class, race, and other factors) are essential to understanding how hegemonic masculinity operates, it is 'always constructed in relation to various subordinated masculinities as well as in relation to women. There is no femininity that is hegemonic in the sense that the dominant form of masculinity is hegemonic among men.'[81] In the context of WHS, the valorisation of a 'tough' (white) masculine worker archetype is a factor in how workers approach safety issues and perform nonchalance about their personal safety.[82] Moreover, hegemonic masculinity is directly related to fatalities, injuries, and suicide.

As hi-vis becomes more common and everyday, its symbolic associations also evolve. Significant socio-cultural shifts in hi-vis usage are apparent from around the year 2000, and this occurs in overlapping waves. First, hi-vis began appearing on individuals outside the industrial workforce, particularly in the context of political worksite visits. During the early 2000s, the practice of politicians donning hi-vis for media opportunities commenced, emerging as a symbolic political performance tied to ideas of productivity, economic development, and political relatability (which has proliferated at recent elections). This theatrical appropriation of hi-vis coincided with changes to WHS legislation, which in some workplaces led to blanket rules that *all* those on site must wear hi-vis. Transport for NSW images suggest that political figures do not routinely wear hi-vis in public until around the year 2000.[83]

Secondly, the early 2000s also saw the rise of an Australian mining boom (approx. 2005–12), and the national harmonisation of state-based WHS legislation in 2008.[84] From roughly the second decade of the 2000s, hi-vis garments increasingly functioned as almost universal uniforms across a wide range of industrial and semi-industrial roles, including uses that demarcate employment

[81] R.W. Connell, *Gender and Power: Society, the Person and Sexual Politics* (Cambridge: Polity Press, 1987), 183.

[82] A. Milner, A. Kavanagh, T. King, and D. Currier, 'The Influence of Masculine Norms and Occupational Factors on Mental Health: Evidence from the Baseline of the Australian Longitudinal Study on Male Health', *American Journal of Men's Health* 12, no. 4 (2018): 696–705.

[83] One exception to this is former NSW minister Laurie Brereton's rare 1985 appearance wearing an orange DMR vest. Transport for NSW, Historical Image Assets Library, photograph of former minister for roads, public works, and ports, Laurie Brereton, at the opening of the Woy Woy Bridge, 25 January 1985. Image ref: 104162, Box: BOX014, Transport for NSW, State of NSW.

[84] Richard Johnstone, 'Harmonising Occupational Health & Safety Regulation in Australia', *Journal of Applied Law & Policy* 1 (2008): 35–58.

contract type, such as permanent or contract employees. This period also saw greater diversification in the forms and designs of hi-vis clothing, including garments tailored for maternity, diverse body types, and all-day wear, with an increasing shift away from single-size vests to a wider variety of hi-vis shirts, jumpers, jackets, trousers, and leggings in full sizing ranges, and designed to provide full-day comfort. Originally limited to the workplace, hi-vis came to be worn by commuting workers in public and transit spaces, contributing to a broader normalisation of the attire. While rare today, some residual stigma persists, particularly in venues such as exclusive bars or RSL clubs,[85] some of which explicitly disallow hi-vis after certain hours, reinforcing older associations between the garments and a working-class or 'rough' aesthetic. Such exclusions are increasingly the exception rather than the rule, as hi-vis becomes more embedded in the visual and material culture of contemporary Australia.

Political-economic factors: Deindustrialisation and local garment production

The story of Australian deindustrialisation is crucial to understanding the mass proliferation of hi-vis garments that occurred during the second decade of the twenty-first century. To contextualise this recent expansion, we must return to the final decades of the twentieth century, when most hi-vis clothing sold in Australia was manufactured domestically. At that time, Australia's relatively small market size posed logistical and financial constraints. Because Australian production runs were small, twentieth-century Australian-made hi-vis garments were typically limited in terms of form, sizing, styling, materials, and tape configurations. Although more advanced fabrics and design options existed in larger overseas markets such as Germany, the UK, and the US, Australian manufacturers were constrained by both geography and demand.

These pressures were exacerbated by Australia's economic restructuring in the 1980s and 1990s, particularly during the Hawke–Keating Labor Governments (1983–96). The reduction and eventual removal of protective tariffs on the textiles, clothing, and footwear (TCF) industries during this period undermined the economic viability of local TCF manufacturing (and Australian manufacturing more broadly). These reforms led to factory closures, job losses (especially for women and migrant workers), and the broader dismantling of the TCF sector's skilled labour base.[86] Hi-vis manufacturing was no exception: apart from tightly regulated uniforms for defence and police forces, production was steadily offshored to lower-cost regions in Asia and the Pacific, where labour protections and environmental standards were often weaker. Key players in hi-vis manufacturing in Australia were the workwear companies Yakka, King-Gee, Can't Tear 'Em, and, a little later, Bisley. Many of these

[85] An RSL club is community and entertainment venue operated by the Returned and Services League of Australia (RSL), a veterans' welfare organisation.

[86] Michael Webber and Sally Weller, *Refashioning the Rag Trade: Internationalising Australia's Textiles, Clothing and Footwear Industries* (UNSW Press: Sydney, 2001).

companies offshored their production in the 1990s and early 2000s. King-Gee initially offshored much of its production to Fiji in the 1990s. Can't Tear 'Em maintained onshore production until 2009, after being absorbed by Pacific Brands in 2007. Yakka gradually offshored over a period of years, finally closing its Broadmeadows local operation in 2013.[87]

Today, hi-vis garments are emblematic of globalised mass production, characterised by overproduction, under-pricing, and growing concerns about environmental sustainability. Online retailers in Australia now offer hi-vis vests for as little as AUD$2.95, raising troubling questions about the labour conditions under which these garments are made – typically by women workers in the Global South who are poorly paid. This situation reveals an uncomfortable irony: garments designed to safeguard the bodies of (often male, industrial) workers in Australia are themselves produced under conditions that can endanger a different class of (frequently female, offshore) workers. The 2013 Rana Plaza Factory collapse in Bangladesh – with a death toll far exceeding Australian industrial disasters – is one of the most egregious examples of the harm that textiles workers have faced, while labouring to create garments for consumption in the Global North. This contradiction points to the broader tension at the heart of hi-vis clothing: a technology of protection embedded in an extractive and harmful global production system.

Conclusion

In tracing the early history of hi-vis workwear in Australia, this article has demonstrated that hi-vis was not born of cultural symbolism or aesthetic intent, but emerged from a largely pragmatic drive to improve worker safety in dangerous industries. From the mid-1960s onwards, its introduction was spearheaded by state government departments – particularly in road and rail sectors – with union support playing an important role. However, as we have seen, the rollout was far from uniform. As charted in this article, the early adoption of hi-vis was shaped by interrelated factors: practical concerns such as thermal comfort and colourfastness; evolving regulatory and compliance frameworks; specific industry risks, union demands and internal decision-making cultures; broader socio-cultural attitudes; and, finally, the political-economic structures impacting garment manufacturing within and outside of Australia. Together, these shaped a patchy, regionally varied, and often slow-moving course, for what would eventually become a ubiquitous category of everyday clothing. The exponential rise of high-visibility clothing in Australia reflects two intertwined historical trajectories: one associated with social progress, and the other with environmental degradation. As discussed throughout this article, the uptake of hi-vis has accompanied the growing prominence of

[87] This discussion of hi-vis major manufacturers was influenced by our interview with workwear executive Andrew Panther (2025) and later fact-checked.

WHS awareness and legislation since the 1970s in Australia, in parallel with similar jurisdictions such as the UK. Yet this also unfolded within an economic framework increasingly characterised by linear production models, synthetic fabrics, globalised mass-manufacturing, and unsustainable consumption, all of which have contributed to severe environmental harm and global textile waste crises.

The foundational history outlined here underscores that early uses of hi-vis were rooted not only in spectacle or cynical neoliberal performance, but also in practical necessity and the meaningful intention to keep workers safe and (ideally) comfortable. Alongside this, the significant decline of union power in Australia (and elsewhere) in the neoliberal era has constrained the development of effective WHS frameworks, alongside issues like the rise of 'flexible' work arrangements.[88] Union power and labour organisation, and the ability to leverage these in relation to WHS, are correlated to whether laws and policy are initiated, the content of these, and how such frameworks are operationalised on the ground. Thus, while Robens was a key turning point in relation to WHS, driving employers to meet obligations under statutory general duty provisions, its promise was fundamentally shaped by what followed. Key in Australia to this context was the Hawke–Keating Labor Government's thirteen-year formal Accord with the trade unions and its attacks on labour organisation, including the right to strike, and its impact on plummeting trade-union density.[89] In its initial decades, hi-vis garments were evaluated less for what they represented, and more for whether they could endure laundering and harsh Australian sunlight, and be safely and comfortably worn in extreme climates. Yet, as glimpsed in the end of our discussion on manufacturing, some of the ironies that would later define hi-vis – its transformation into a mass-produced, performative, and sometimes exploitative global product – were already latent. In future work, we will turn our attention to the political and gendered dimensions of hi-vis in a greater level of detail, examining how a garment designed for functional protection has been reframed through culture, class, identity, protest, and authority. But for now, this article establishes the practical, piecemeal, and state-anchored origins of hi-vis in Australia: it is a story less about spectacle, and more about safety and sweat.

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[89] E. Humphrys, *How Labour Built Neoliberalism: Australia's Accord, the Labour Movement and the Neoliberal Project* (Brill, 2019).

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