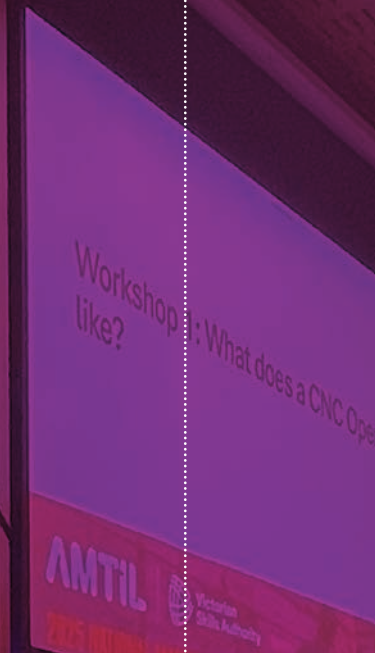




AMTIL



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Workshop
like? What does a CNC Oper



AMTIL Victorian Skills Authority



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2025 National Manufacturing Technology Skills Summit

Post Summit Report:
Attracting and Training
3,000 CNC Operators

Introduction

This paper summarises the discussions held at the 2025 National Manufacturing Technology Skills Summit. The event brought together key stakeholders from government, academia, industry associations, and industry to address one very specific skills gap for immediate and forecasted skills needs of the Australian manufacturing technology workforce. The invitation-only Summit aimed to result in a specific action plan to 'move the dial' within an agreed timeframe.

The Summit, held in August 2025 at the National Press Club Canberra, facilitated discussions over a full-day workshop involving with 40 organisations. It facilitated the sharing of insights to help build actionable joint strategies that can bridge the Computer Numerical Control (CNC) operator skills gap and shortages, and enhance workforce capabilities in a fast moving and ever-evolving economic and industrial landscape.

Stakeholder feedback suggests CNC Operator shortages are a significant challenge within the industry. AMTIL estimates that the shortage currently sits at more than 1,000 roles and to meet future needs, we will need to attract and train more than 3,000 people over the next two years.

This Summit differed from others with its specificity to a defined skill set and its collaborative approach. In doing so, it facilitated a highly tailored discussion that can translate into a specific strategy and work plan, in turn facilitating a system to measure the impact of related efforts.

The Summit was hosted by AMTIL, facilitated by Owen Chapman (Senior Skills Advisor at the Victorian Skills Authority), and attended by ecosystem experts (see Appendix 1 for organisations represented).



Background

Australia is experiencing significant transformations in its economic and technological landscape, leading to evolving skills requirements across various sectors. Educating and encouraging Australians to pursue careers in manufacturing has emerged as a significant challenge.

For many years, AMTIL has advocated for a consolidated and collaborative approach to addressing the industry's need for new talent, including apprentices and engineers. Several factors shape current challenges, including:

- The significant shift in the manufacturing landscape from subsidised or protected volume manufacturing to low-volume, high-value manufacturing.
- The relocation of industries such as textiles, clothing, footwear (TCF), and the automotive sector to countries with lower labour costs. These shifts played out publicly, developing and reinforcing many Australians' attitudes about the sector.
- The substantial growth of other industry sectors, occupying a larger portion of the nation's GDP, conveyed the message that manufacturing was declining rather than evolving. This perception led to a negative view of manufacturing careers among the public and government, causing young people and their mentors to lose faith in the prospects of manufacturing careers, resulting in a sharp decline of interest.
- Additionally, Australian engineering businesses have historically been quite introverted, exclusionary, and uncollaborative, which kept them isolated for decades. This inward focus is not conducive to attracting new talent.

Hundreds of businesses are impacted by (and often working independently to address) these concerns, meaning a significant opportunity for strategic alignment exists.

Choosing to focus on one skillset of critical need mitigates the challenges of scope creep, resulting in a focused effort to efficiently remedy a key challenge. In this instance, the cohort chosen was CNC operators.

While this focus is somewhat limited and short-term, when considered against the broader challenges of the industry, ideally it can serve as a case study that could be replicated across other skillsets. Additional medium and long-term strategies should be layered on top of this initiative, to capitalise on momentum. However, this effort is a needed start of the rectification process.

Supporting Material

A 2022 AMTIL member survey sought to identify the skill sets the industry required over the next two years. In 2023, a follow-up survey determined the skill needs for the next five years. The summarised results were normalised across 75 companies to account for a significant discrepancy in response volume between surveys.

Scope of Focus

Most machinery within the Australian precision manufacturing industry has moved toward computer operation. These computer-driven machines are operated by a mix of semi-skilled (non- tradesperson) and highly-skilled (tradesperson) Computer Numerically Controlled (CNC) Machine Operators.

Highly skilled operators can leverage machines for increasingly complex tasks such as changing tools, manipulating tool paths and adjusting component geometry.





WORKSHOP

Job Title, Shared Understanding

The workshop commenced with an endeavour to find a shared definition of a CNC operator.

It was found that there is no specific ANZSCO code for “CNC operator”, instead roles are often assigned to **323214 Metal Machinist (First Class)** or the broader category of **711999 Machine Operators nec** if the position isn’t metal-focused. Code selection is influenced by several variables including the type of work being performed, capabilities of machinery, and materials worked with.

Facilitated discussions uncovered an inconsistent application of the term “CNC operator” within the industry, ranging from entry-level operators to advanced technologists. A unified approach to terminology could serve as reference points for training, recruitment, and workforce planning.

Participants agreed that titles indicate differing level of responsibility, technical expertise, and career progression. Commonly used titles include:

- CNC Technologist
- CNC Manufacturing Technologist
- CNC Operator (two variations)

Core Tasks

While duties varied by organisation, common skills and responsibilities for CNC operators included:

- Mechanical aptitude and problem solving
- Reading and interpreting technical drawings
- Operating CNC machinery and performing maintenance
- Data entry and attention to detail
- Communication and teamwork

These skills and responsibilities served as a foundational understanding of the skills needed for success roles broadly associated with the term “CNC operator”.

Tools & Technology

This discussion uncovered the common equipment, software, and resources used in relevant roles. Results demonstrate the importance of hands-on experience with industry-standard tools and the need for accessible training platforms. Examples include:

- CAD/CAM software
- CNC machines and robotics
- Measuring tools (e.g., callipers, verniers)
- Training resources (e.g., TAFE packages, online resources like YouTube)
- Material handling and computing devices

The tools and technologies reflect both the technical demands of the job and the evolving nature of CNC work.

Skills Level

This discussion identified the level of competency required for each role, including both technical and soft skills. Desirable skills and traits include formal qualifications (e.g., Certificate II/III), trade levels, and personal attributes such as:

- Digital literacy
- Maths and geometry understanding
- Mechanical mindset and aptitude to learn
- Communication and time management
- Ability to follow instructions and work collaboratively

Skill levels are often tiered, showing progression from basic operator functions to advanced programming and design capabilities.

Education

While required educational backgrounds can vary, several common pathways were identified for entry into each role. Options include formal schooling levels, vocational training, and alternative pathways such as:

- Year 10/11 completion
- Pre-apprenticeship programs
- Short courses (e.g., 4–8 weeks)
- Micro-credentials and statements of attainment

The education pathways emphasise flexibility and accessibility, allowing students and career changers to enter the CNC field through multiple routes.

Pathways

Several common stages were mapped out as potential career trajectories that built upon each preceding role. This pathway shows how foundational roles can lead to more specialised or senior positions, such as:

- Programmer
- Engineer
- CAD/CAM designer
- Mechatronics technician
- Management and service roles

Discussions around pathways also highlighted the importance of mentorship, role models, and modernised qualifications to support long-term career development. The pathways demonstrate how early exposure and targeted training can help build a sustainable CNC workforce.

Speakers

Paul Phillips – Managing Director, Bernco Machines

Matthew Baker – Department Manager – Engineering, Christchurch Institute of TAFE

Ashley Mulder – Membership Officer, AMTIL

AMTIL Victorian Skills Authority

2025 National Manufacturing Technology Skills Summit

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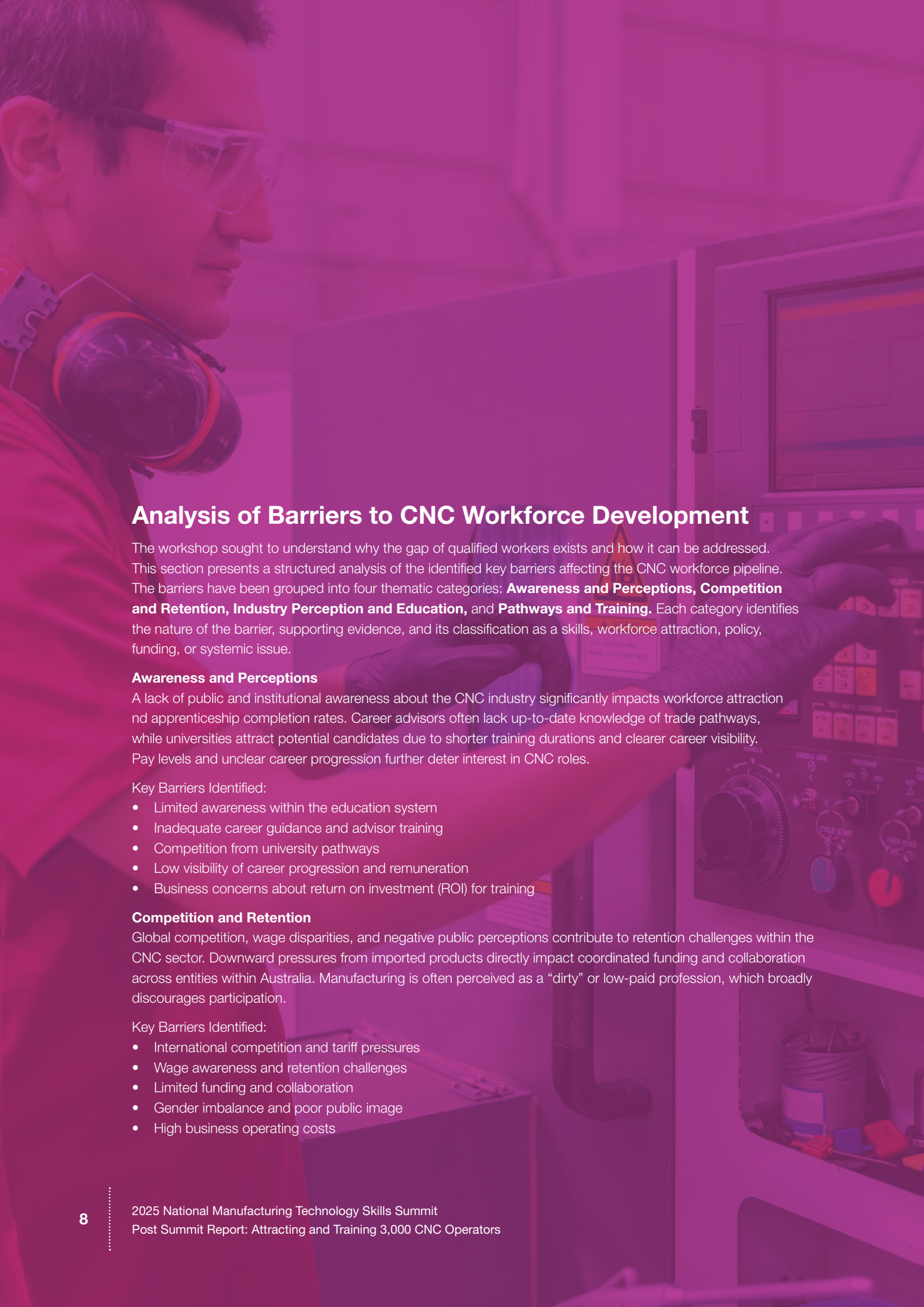
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...the sharing of insights to help build actionable joint strategies that can bridge the Computer Numerical Control (CNC) operator skills gap and shortages, and enhance workforce capabilities in a fast moving and ever-evolving economic and industrial landscape.

A CNC operator wearing safety glasses and ear protection, working on a machine. The image is overlaid with a semi-transparent purple filter.

Analysis of Barriers to CNC Workforce Development

The workshop sought to understand why the gap of qualified workers exists and how it can be addressed. This section presents a structured analysis of the identified key barriers affecting the CNC workforce pipeline. The barriers have been grouped into four thematic categories: **Awareness and Perceptions, Competition and Retention, Industry Perception and Education**, and **Pathways and Training**. Each category identifies the nature of the barrier, supporting evidence, and its classification as a skills, workforce attraction, policy, funding, or systemic issue.

Awareness and Perceptions

A lack of public and institutional awareness about the CNC industry significantly impacts workforce attraction and apprenticeship completion rates. Career advisors often lack up-to-date knowledge of trade pathways, while universities attract potential candidates due to shorter training durations and clearer career visibility. Pay levels and unclear career progression further deter interest in CNC roles.

Key Barriers Identified:

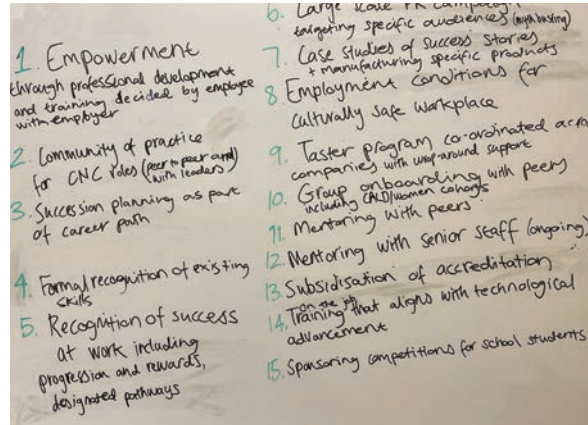
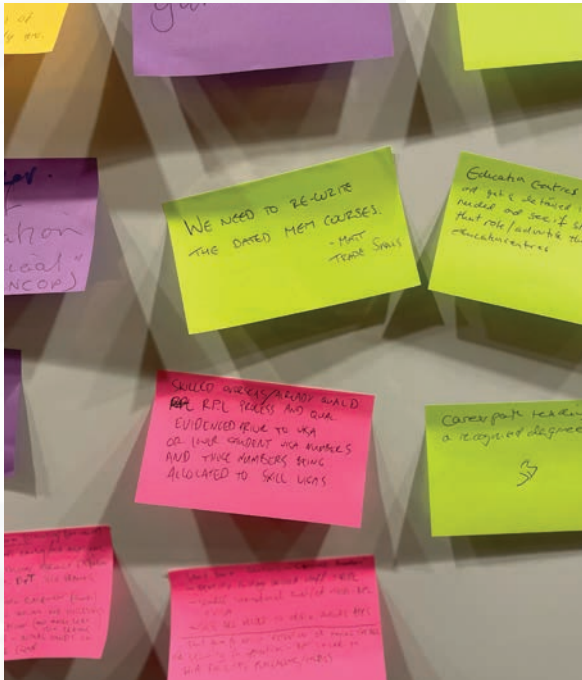
- Limited awareness within the education system
- Inadequate career guidance and advisor training
- Competition from university pathways
- Low visibility of career progression and remuneration
- Business concerns about return on investment (ROI) for training

Competition and Retention

Global competition, wage disparities, and negative public perceptions contribute to retention challenges within the CNC sector. Downward pressures from imported products directly impact coordinated funding and collaboration across entities within Australia. Manufacturing is often perceived as a “dirty” or low-paid profession, which broadly discourages participation.

Key Barriers Identified:

- International competition and tariff pressures
- Wage awareness and retention challenges
- Limited funding and collaboration
- Gender imbalance and poor public image
- High business operating costs



Industry Perception and Education

The CNC industry suffers from outdated perceptions and unclear career pathways. Schools often fail to provide adequate career information, and there is limited integration of manufacturing within STEM programs. As a result, students and career advisors lack exposure to the sector, and other industries frequently poach potential apprentices.

Key Barriers Identified:

- Negative perceptions of manufacturing (unsafe, outdated)
- Undefined career paths due to industry diversity
- Lack of career education in schools
- Weak industry-school connections
- Competition from other sectors

Pathways and Training

Training pathways into CNC roles are often unclear, under-promoted, or financially inaccessible. Parents and career advisors may lack understanding of the manufacturing sector, and the cost of training and equipment presents a significant barrier to entry. Transferable skills are not well recognised, and marketing of trade careers remains limited.

Key Barriers Identified:

- Undefined occupational roles and pathways
- Limited awareness among parents and advisors
- High cost of training and equipment
- Poor visibility of wage potential
- Inadequate promotion of transferable skills

Recruit and Retain - Persona-Based Insights

Using predeveloped personas (persona mapping) each table was asked to identify insights from four distinct personas—Isaiah, Steve, Liam, and Yasmin—to inform targeted strategies for attracting, developing, and retaining individuals in skilled career pathways, particularly within the CNC sector.

Persona Profiles & Strategic Recommendations

Isaiah – Young, Hands-On Learner

Profile Summary: Isaiah is a practical, tactile learner drawn to careers that offer visible success, safety, and income. He thrives on mentorship and structured guidance.

Identified Engagement Strategies:

- Attraction: Use school-based competitions, social media, and influencer campaigns to spark interest.
- Development: Offer hands-on training, clear career mapping, and work placements.
- Retention: Provide ongoing mentorship, standardised onboarding, and training that evolves with technology.

Training Recommendations:

- Work-integrated learning
- Mentor-supported technical training
- Modular programs aligned with tech advancements

Steve – Experienced Worker Ready to Upskill

Profile Summary: Steve is loyal and experienced, seeking recognition and autonomy in his career development. He values empowerment and tailored learning.

Identified Engagement Strategies:

- Attraction: Share relatable success stories and emphasise the value of upskilling.
- Development: Introduce hybrid roles, buddy systems, and on-the-job training.
- Retention: Empower Steve to co-design his learning journey and celebrate his milestones.

Training Recommendations:

- Peer-to-peer learning
- Flexible, role-specific upskilling programs
- Formal certification pathways with pay incentives

Liam – Creative, Purpose-Driven Explorer

Profile Summary: Liam is motivated by creativity, impact, and long-term career vision. He responds well to storytelling and personalised guidance.

Identified Engagement Strategies:

- Attraction: Use myth-busting campaigns and expert-led conversations to build trust.
- Development: Highlight real-world problem solving and funded training opportunities.
- Retention: Offer career clarity, performance recognition, and succession planning.

Training Recommendations:

- Creative project-based learning
- Personalised career mapping
- Community of practice and mentorship

Yasmin – Community-Oriented Parent Returning to Work

Profile Summary: Yasmin seeks secure, flexible employment that accommodates her family responsibilities. She values inclusivity and community support.

Identified Engagement Strategies:

- Attraction: Promote no-experience-needed roles via social media and community referrals.
- Development: Provide fast-track bridging programs and parent-friendly hours.
- Retention: Ensure culturally appropriate facilities, flexible scheduling, and recognition.

Training Recommendations:

- Group-based onboarding
- Bridging programs linked to national education pathways
- Remote learning options and flexible trade entry

Cross-Persona Themes

Exploration of how to support each persona resulted in some common themes. The following were recommended as consistent difference makers.

Theme	How to address within industry
Mentorship & belonging	Build structured mentor programs with continuity
Flexibility	Offer adaptable training formats and schedules
Recognition & progression	Celebrate milestones and provide clear advancement
Inclusivity	Ensure cultural, gender, and family-friendly provisions
Storytelling & Impact	Use narrative-driven marketing to inspire and inform

Recommendations Summary

- Develop persona-specific onboarding funnels using strategically targeted messaging and media.
- Create modular training pathways that accommodate different learning styles and life stages.
- Invest in mentor development and peer-led support systems.
- Ensure inclusive infrastructure and flexible work arrangements.
- Use real-world success stories to build trust and aspiration.

Ideas, Funding & Resources

Workshop participants were asked to vote for the three identified strategies and interventions which they believed were most likely to succeed. The results were near-unanimous, identifying the following three initiatives as broadly supported and high-priority for implementation.

National PR Campaign to Rebrand Manufacturing

Idea: Launch a coordinated, industry-driven public relations campaign to reposition manufacturing as innovative, exciting, and essential—highlighting “wow” sectors like F1, space, and defence.

Funding:

- Federal government programs
- NGO and private sector contributions
- Existing manufacturing alliance (e.g., pilot by MISA)

Resources:

- Influencer packs, brand kits, expert voices
- TV, social media, TikTok, and recruitment content
- Comparative research on global success stories
- Coalition of industry partners to unify messaging

Establish Occupational Standards for CNC Roles

Idea: Create a nationally recognised occupational standard for CNC roles to improve clarity, mobility, and training relevance.

Funding:

- Government support
- Industry co-investment

Resources:

- ANZSCO/OSCA code registration
- Skill checklists led by industry
- Models from AI/IT and WELD Australia
- Jobs & Skills Councils for CNC training coordination
- International qualification transfer frameworks

Build a CNC Community of Practice

Idea: Develop a regionally focused, industry-led community to share knowledge, showcase work, and support learners and professionals.

Funding:

- Industry subscriptions
- Support from organisations like ICN

Resources:

- Facebook groups, YouTube examples, social media
- RTO engagement with students
- 3D printing and CNC content hubs
- Structured forums and gateway topics

Summary and Next Steps

This report fulfills the commitment to publish key findings and recommendations from the National Manufacturing Technology Skills Summit. The next steps are to develop an action plan, by mobilising the collective to:

- Conduct a consultation on the White Paper.
- Call for expressions of interest to establish a steering group/s to finalise the action plan.
- Communicate about and broadly promote the plan.
- Initiate the action plan and evaluate progress.



Appendix 1: Organisations Represented by Summit Attendees

Advanced Manufacturing Growth Centre

All Manufacturing Personnel

Australian Manufacturing Technology Institute Limited (AMTIL)

ANCA CNC Machines

Australian Chamber of Commerce and Industry (ACCI)

Australian Industry Group

Australian Institute of Engineering

Australian Manufacturing Workers' Union

Australian Packaging and Processing Machinery Association Ltd

Benson Machines

Catten Industries

Chisholm TAFE

Commonwealth Scientific and Industrial Research Organisation (CSIRO)

Cub Campers

Industry Capability Network (ICN)

Livetools

Manufacturing & Engineering Skills Advisory Body

Manufacturing Industry Skills Alliance

Okuma Australia

QLD Manufacturing

Robotics Australia Group

Ronson Gears

South East Melbourne Manufacturing Alliance (SEMMA)

Sheetmetal Machinery Australia

Sorenson Engineering

Sutton Tools

TAFE NSW

TasTAFE

The BCW

Victorian Department of Jobs, Skills, Industry and Regions

Trade Skills Australia



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