



**Victorian
Skills Authority**

Victorian Skills Plan

Transport, Postal and Warehousing Industry Insight

October 2022



Education
and Training



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Introduction

This report on the Transport, Postal and Warehousing industry forms part of the 2022 Victorian Skills Plan and outlines demand for occupations, education and training directed to meeting the demand and current workforce issues facing the industry.

This report has been prepared by the Victorian Skills Authority (VSA). The VSA was formed in July 2021 in response to the review *Future Skills for Victoria: Driving collaboration and innovation in post-secondary education and training* (known as the Macklin Review). The VSA is charged with preparing an annual Victorian Skills Plan (the Skills Plan) to guide decision-making on skills and training, by the Government, education and training providers, industry and communities.

The Victorian Skills Plan

The annual Skills Plan sets out Victoria's skills needs for 2022 to 2025 by drawing on data, evidence and insights from a range of system-wide and local sources.

The Government in conjunction with industry, communities and education and training partners brings collaborative action through the Skills Plan which:

- **defines skill needs** with clear statements of required skills and capabilities (current and emerging)
- **sets priorities** for post-school education and training in Victoria
- **communicates to the community** the opportunities education and training can provide to offer careers for individuals that also meet the workforce needs of industry
- **aligns action** across industry and government to support improved outcomes for all Victorians.

The Skills Plan consists of:

- a summary report – the Victorian Skills Plan
- the industry needs of the Victorian economy segmented into 13 insight reports, each comprising like industries – of which this report is one
- profiles of industry and occupations in the regional areas of Victoria which outline priorities for skills development – either as snapshots or Regional Skills Demand Profiles
- current employment and forecast demand to 2025 across Victoria – a user-driven dashboard.

About Industry Insight Reports

Each industry insight is based on robust research, qualitative and quantitative data collection and analysis and extensive consultation with the Government's Industry Advisory Groups, partners and stakeholders over a period of six months. Each report sets out to:

- profile the **industry outlook**, taking into account sector trends and key drivers of demand
- detail the **workforce and skilling implications** of the industry based on forecasting
- set **industry priorities** in responding to current and future workforce challenges
- provide initial guidance for an **education and training response** to these challenges.

The industries reflected in each report are defined according to their classification within 1292.0 - *Australian and New Zealand Standard Industrial Classification (ANZSIC) 2006*, prepared by the Australian Bureau of Statistics. Occupations within industries have been defined using the *Australian and New Zealand Standard Classification of Occupations (ANZSCO)*.

Each industry insight contributes to the conclusions and recommendations of the Skills Plan, focusing on actions for implementation over a three-year period.

The VSA acknowledges and extends sincere thanks to the individuals and organisations that participated in the consultations and contributed to these materials.

Using this report

This is a point-in-time report on the transport, postal and warehousing industry in Victoria and the associated skills and workforce issues.

This report, along with the Skills Plan, has been prepared for industry and provider partners as a summary of demand for occupations and workforce issues. In addition to being used by the Victorian Government to consider responses, as a public document it is available to industry and education and training partners to form actions and responses.

The report does not represent the full picture of workforce issues in the industry. Opportunities associated with skills and workforce are longstanding. The information in the report, however, provides the basis for ongoing work on skills demand and responses, including by the VSA and through the Industry Advisory Groups.

Feedback

Feedback on this report, and others, is welcome and can be provided to SkillsPlan@education.vic.gov.au. Feedback will contribute to developing insights and actions.

Report coverage

This report focuses on the transport, postal and warehousing industry as defined under ANZSIC and the occupations relevant to the industry, classified according to ANZSCO. It covers road, rail, water, air and space transport, postal and courier pick-up and delivery services, transport support services and warehousing and storage services.

Statistics about an industry and its sub-sectors are collated by the Australian Bureau of Statistics (ABS) from the activity of businesses. Each business is classified to an industry based on their primary activities. Where an individual works for multiple businesses, their main job is used.

Industry classifications rarely encompass the full nature of the work (and therefore skills) associated with a given industry. ABS definitions of industries or sectors may not align with the definitions used by an industry association, while the allocation of businesses on primary activity can result in businesses that perform similar services but with a different emphasis being classified across different industries.

Coverage in this report is limited to employment in the industry and sectors as defined by ABS, noting some occupations are almost exclusively associated with an industry, such as air transport professionals in the transport sector, while others, such as accountants and electricians, are associated with many industries. Note, however, that occupational demand for Victoria is the total of occupational demand for all industries.

Table 1 sets out activities that may occur within the transport, postal and warehousing industry but are reported formally under other industries. The relevant Industry Insight report is listed.

Table 1 | Scope of related industry activities and insights related industries

Activities	Industry insight
<ul style="list-style-type: none"> Operating ticket sales or booking offices of non-resident airlines Providing crating or packing for road freight transport 	Administrative and Support Services
<ul style="list-style-type: none"> Constructing or general repair of railway permanent way, harbour or other transport infrastructure Constructing port facilities 	Construction
<ul style="list-style-type: none"> Repairing railway stock, locomotives and aircrafts Refitting or converting ships Repairing ships and boats (including factory overhauls or factory conversions) 	Manufacturing
<ul style="list-style-type: none"> Providing aerial surveying services Planning port facilities 	Professional, Financial and Information Services
<ul style="list-style-type: none"> Providing surveillance and control of the borders of the country 	Public Administration and Safety
<ul style="list-style-type: none"> Leasing or hiring trucks without drivers Leasing taxicab plates (not vehicles) Leasing, hiring, or renting motor vehicles without drivers Leasing, hiring, or chartering ships without crew Leasing or chartering aircraft without crew from own stocks Hiring or leasing pallets (from own stocks) Self-storage renting or leasing 	Rental Hiring and Real Estate Services

Activities	Industry insight
<ul style="list-style-type: none"> • Providing recreational activities involving direct participation by the customer such as bungee jumping, cave diving and white-water rafting • Providing airline food catering services • Wholesaling fuel at airports 	<p>Services</p>

Executive summary

Industry outlook

The transport, postal and warehousing industry is critical to enabling the movement of people and goods across Victoria and supports the business operations of most other industries. Over 184,500 people are employed across the industry.¹

The COVID-19 pandemic has resulted in fluctuating demand across each of the industry's sub-sectors. Passenger transport and the overall supply chain have been heavily affected. At the same time, eCommerce is driving unprecedented growth in postal and courier services. The key drivers of future occupational growth in this industry include the return of international and recreational travel, government investment and the emergence of new business models.

Workforce and skilling implications

On average, across all industries total employment is expected to grow by an additional 211,900 workers to 2025, from 3,538,900 workers in 2022, an annual growth rate of 1.97 per cent^{a,2,3} In comparison between 2017 and 2020 employment grew by 2.68 per cent^b annually.⁴

In the transport, postal and warehousing industry, employment is expected to grow by an additional 14,400 workers to 2025, from 184,500 workers in 2022, an annual growth rate of 2.35 per cent^c which is higher than the overall Victorian average across all industries.^{5,6} In comparison between 2017 and 2020 employment across this industry grew by 7.31 per cent^d annually.⁷

Substantial workforce growth will be required to meet expected demand. By 2025, an estimated 25,500 new workers are needed.⁸ This includes employment growth of 14,400 and replacement of 11,100 retirees.^{9,10}

Table 2 identifies the top ten occupations in demand across the industry to 2025. Of these, six occupations (highlighted in table) are expected to experience employment growth at a rate above the overall Victorian average between 2022 and 2025.

Table 2 | Occupations in demand in the transport, postal and warehousing industry to 2025^{e,11,12}

Occupation	Current employment	Employment growth (2022–25)		Retirements (2022–25)	New workers needed (2022–25)
		Number	Per cent		
Truck drivers	26,500	1,150	1.3%	1,850	3,000
Bus and coach drivers	9,450	900	2.4%	900	1,800
Automobile drivers	14,800	1,150	2.8%	550	1,700
Storepersons	12,750	850	2.5%	600	1,450
Delivery drivers	10,900	850	3.1%	600	1,450
Couriers and postal deliverers	8,700	250	0.6%	700	900
Air transport professionals	3,800	600	6.7%	200	800

^a 3-year compound annual growth rate

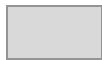
^b Computed for 2017 to 2020 employment growth for pre-COVID comparison

^c 3-year compound annual growth rate

^d Computed for 2017 to 2020 employment growth for pre-COVID comparison

^e Due to rounding, some totals may not correspond with the sum of the separate figures

Mail sorters	5,000	400	2.4%	400	750
Forklift drivers	8,700	350	1.9%	350	700
Transport and despatch clerks	8,050	300	1.5%	350	650

Legend

Above Victorian employment growth average between 2022 and 2025

The need for roles such as supply chain managers and process automation specialists is growing substantially because of the increasing role of eCommerce. New technologies and innovations are driving demand for emerging roles such as drone operators, data scientists and blockchain engineers.

Industry has also identified changing skill needs. Skills in using drones and other autonomous vehicles in controlled environments are needed. Other skills include an understanding of growing sustainability and ethical demands from consumers.

Meeting this demand will be challenging as there are already key shortages in 19 occupations of specific relevance to the transport sector. Industry also reports low awareness of employment opportunities, insecure work and poor conditions that further deter people from entering the sector.

Workforce priorities

Three priorities have been identified that can help address workforce and skilling needs for the transport, postal and warehousing industry:

1. Support workers to have the skills and experience to operate safely
2. Manage the workforce as industry rapidly adopts new technology and processes, which will occur at different time points for different sectors
3. Support training of workers for niche but critical roles and explore ways to attract underrepresented cohorts

Transport, postal and warehousing pipeline and workforce response

Pathways to employment in the industry are split across Higher Education and VET. Nearly one in five workers hold a degree or above (19 per cent) and 34 per cent hold a VET qualification as their highest level of education.¹³ As an indication of the potential skill pipeline, there were approximately 16,730 enrolments in relevant VET qualifications in 2020 and more than 1,520 equivalent full-time study load (EFTSL) in higher education in 2019.^{14,15}

Key VET entry points to the industry include the Certificate II in Rail Infrastructure, the Certificate II and III in Supply Chain Operations, Certificate III in Driving Operations, and the Diploma of Logistics.¹⁶ Some courses feature low enrolment numbers and opportunities exist to better respond to demand, especially because courses do not always map to what employers need.

Expanding interest and awareness in roles available could be a focus through providing more career pathway opportunities, particularly for women who are underrepresented in the industry. There is also an opportunity for the education response to explore new training offerings that ensure licensed drivers have the skills to operate safely. The response can support the training of specialist, low volume occupations, such as harbour masters, maritime pilots, and stevedores, through the delivery of micro-credentials and close collaboration between industry and VET.

Opportunities for action include undertaking market sizing activities to help with forward planning, building the supply of labour through licensing and migration and supporting the transition to clean energy. Without consideration of the currently poor and unsafe working conditions in some areas, the

industry will continue to face challenges in attracting a skilled workforce.

Table 3 highlights actions that can be adopted by education, industry and government to meet workforce demand.

Table 3 | Actions for consideration for education, industry and government

- Expand interest and awareness of transport related occupations for under-represented groups in the industry (e.g., females) and explore clear pathways into these roles.
- Review licensing requirements to ensure drivers have the skills to safely operate a vehicle.
- Review training provision in thin (low enrolment) but critical markets to the Victorian economy.
- Collectively work to understand the true size of the transport workforce to ensure adequate workforce planning.
- Explore ways of improving working conditions for employees.
- Manage the industry transition to meet different rates of change across the sector.

Industry outlook

The transport, postal and warehousing industry provides services which support many Victorian individuals, businesses and organisations

The transport, postal and warehousing ('transport') industry plays a key role in enabling Victoria's economic activity. Without this industry, no passengers or freight would move. It is responsible for the transportation of cargo, the warehousing and storage of goods and the movement of passengers by road, rail, air and water transportation, as well as for support activities that are related to each mode of transportation.¹⁷ The industry interacts with, supports and has flow-on effects for all other industries and comprises three sectors: postal and courier services; transport and support services; and warehousing and storage services (see Figure 1).

Demographic changes will have significant implications on future demand in the transport industry. Despite an estimated loss of approximately 160,000 working age people compared to pre-COVID population forecasts, Victoria is facing a period of growth and change in the medium to long-term.¹⁸ Much of the growth will be concentrated in the Metro Melbourne area, and regional Victoria's population is forecast to grow by 746,700 people from 2016 to 2056.¹⁹

Victoria's supply chain advantages make it an attractive place for businesses to locate and it contributes approximately \$21 billion per year to the economy.²⁰ Melbourne is strategically located within key supply chain infrastructure, including 24-hour road access to 80 per cent of Australia's population.²¹ The city's major ports, roads, rail, airports and freight hubs are well networked for freight movement to local, regional, interstate and international markets.²² With the marketplace for goods and services becoming increasingly international, many businesses in this industry also have facilities, employees and equipment spread across regional Victoria.²³

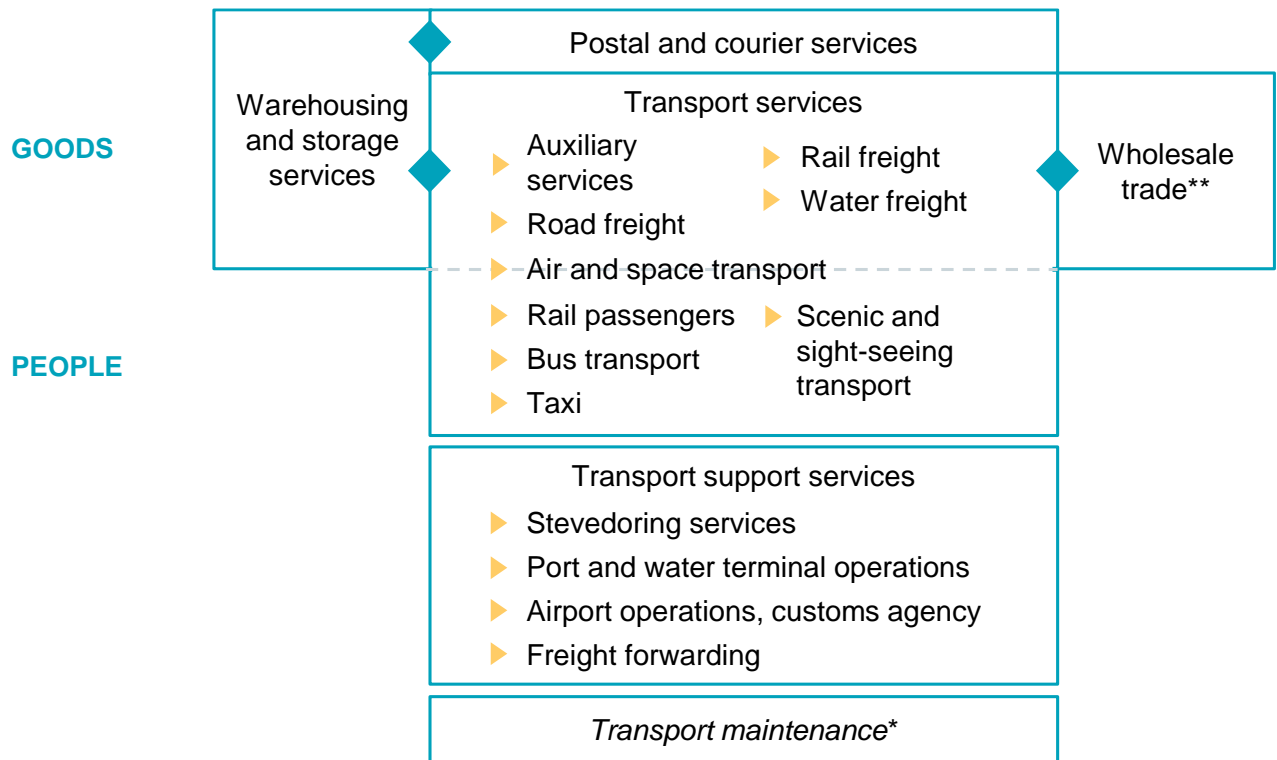
Victoria's supply chain advantages make it an attractive place for businesses to locate and contributes approximately \$21 billion per year to the economy.

The transport industry directly employs 5.2 per cent of the total Victorian workforce (184,500 workers).²⁴ This figure underestimates the many other businesses that provide transport services but whose main function is not transport, such as restaurants offering delivery services. The industry represents at least 2.9 per cent and up to 5.6 per cent of employment in every Regional Partnership area.^{25,26} This share has remained steady over the past 40 years.²⁷

Workers in the industry are mostly male, older and reasonably well paid. Only 24.5 per cent of workers are female (44,974 workers) - significantly lower than the Victorian average of 47.2 per cent.²⁸ Approximately 36.2 per cent of workers in the sector are aged over 50 (47,106 workers), which is higher than the Victorian average of 29 per cent.²⁹ National annual earnings for the transport, postal and warehousing industry is \$82,836 - higher than the national average (\$69,103).³⁰

Industry employment is concentrated around truck drivers (14 per cent), automobile drivers (8 per cent) and storepersons (7 per cent).³¹ Most of the industry's largest occupations by employment size are experiencing skill shortages in at least one Victorian region.³² These figures include workers directly employed by the transport industry only. They do not include, for example, truck drivers employed by other industries.

Figure 1 | Key sectors across the transport industry



*Sub-industry within ANZSIC Repair and Maintenance Services and not included in employment data for this industry.

** Wholesale trade is included within ANZSIC Retail Trade and not included in employment data for this industry.

Postal and courier services

Postal services run the collection and delivery of letters, documents and parcels.³³ They also operate collection points, such as post offices or postal agents.³⁴ Other services involving door to door pickup, such as grocery delivery services are also included.³⁵

Transport and support services

Transport involves providing transportation of passengers and freight by road, rail, water or air.³⁶ Other transportation activities included in this division are scenic and sightseeing transport and pipeline transport (movement of liquid and gases through pipelines).³⁷ The sector also provides support services for the transportation of passengers and freight.³⁸ These activities include stevedoring services, harbour services, navigation services, airport operations and customs agency services.³⁹

The largest sector in this industry is road transport, with 74,900 workers. The smallest sector is scenic and sightseeing transport, accounting for 3,000 workers.






















Warehousing and storage services










The primary activities of warehousing and storage services include bond storage operation and storage services for bulk petroleum, cool rooms, grains and furniture among many others.⁴⁰

The industry has strong projected growth but continues to be challenged by changes in consumer demand, supply issues and advancements in technology

The COVID-19 pandemic has had a disproportionate impact on the transport industry, with declines in passenger transport and significant growth in postal and courier services.⁴¹ Victoria’s ongoing population growth, including in regional areas, along with industry restructuring plus growth due to climate change mitigation had profound impacts on this industry. Understanding broader trends is critical to meeting future demand in this industry. The industry outlook is driven by a range of factors, set out in Table 4.⁴² Factors listed have implications for the sector and related support services.

Table 4 | Drivers of demand in the transport industry

Driver		Postal and courier services	Transport and support services	Warehousing and storage services
Policy	Government investment to significantly boost network capacity, move more people and freight, improve passenger services and relieve congestion.	 Medium	 High	 Medium
Economic	Many businesses are seeking to expand their operations and maximise the efficiency of operations through considered, targeted investment.	 High	 High	 High
	The emergence of new business models and practices enabling workers to have increased flexibility and ownership over their work (e.g., package delivery using private vehicles).	 High	 Medium	 Low
	COVID-19 is continuing to have an impact on supply chains, in conjunction with trade sanctions impacting exports, while also driving a shift towards greater market diversification.	 Low	 Medium	 High
Social	Population growth, particularly in regional areas and peri-urban areas, will drive demand across a range of sectors.	 High	 High	 High
	An increase in eCommerce has required both small and large companies to adapt their operations, with flow on effects for demand in delivery services.	 High	 High	 Medium
	An ageing workforce is impacting the availability of skilled staff and the need to upskill young workers in the industry.	 Medium	 High	 Medium

Driver		Postal and courier services	Transport and support services	Warehousing and storage services
Technological	Advancements in technology (such as robotics, AI, real-time monitoring) is driving more efficient operations and anticipatory logistics to better determine when and where services will be needed and where.	 High	 High	 High
	Rise in semi-autonomous and autonomous vehicles within controlled environments, needing new skills needs for workers across the supply chain. More widespread adoption in uncontrolled environments is likely to occur long-term.	 Medium	 Medium	 High
Environmental	Organisations are increasingly looking to adopt more efficient vehicles; build more sustainable infrastructure and transform the value and supply chain through the circular economy.	 High	 High	 High

Drivers are expected to impact sectors differently across the industry over the next three to five years. Further detail is provided in Appendix A | Drivers of demand.

Postal and courier services

A significant proportion of growth includes couriers and postal deliverers accounting for approximately 900 new workers needed.⁴³ The growth of eCommerce is a key driver, with an increasing focus on convenience rather than price.⁴⁴ In Victoria, online shopping grew by around 110 per cent year-on-year in April 2020 compared to around 20 per cent in 2019.⁴⁵

A 2018 inquiry into the status of on-demand platform workers such as Uber and Deliveroo resulted in the 2022-2023 Victorian Budget allocating \$5.6 million to implement all 20 recommendations from the review.⁴⁶ This will go towards improving conditions for gig economy workers, including planning work for a support service to provide advice on employment status and assist in resolving disputes.⁴⁷ Employment conditions for these workers will shape how well the sector can meet their projected demand.

Significant growth in eCommerce, accentuated by the COVID-19 pandemic, is driving demand for postal and courier services.

Transport and support services

Road and rail

Victoria’s population is expected to reach 11 million by 2056.⁴⁸ This will drive demand for significantly more transport services. The Victorian Government is investing \$80 billion in strategic transport infrastructure to expand and modernise the network.⁴⁹ Major transport investments include Regional Rail Renewal, Melbourne Metro, Suburban Rail Loop, North East Link, West Gate Tunnel, level crossing removals and road upgrades to significantly boost network capacity, move more people and freight, improve passenger services and relieve congestion.⁵⁰ The growth in public transport is expected to require around 150 new drivers per year for the next 3 years.⁵¹ An increase in eCommerce is also requiring businesses to focus more on their transport services capabilities.

Air

The aviation sector was disproportionately affected by COVID-19, with passenger numbers in July 2021 plunging to 23 percent of pre-pandemic levels, after recovering to a peak of 68 percent of pre-pandemic levels in April 2021.⁵² However, the sector has been able to start the recovery process, with Qantas expecting domestic capacity to be at 102 per cent pre-pandemic levels by the third quarter 2022 and 117 per cent in the final months of the year.⁵³

Water

The Port of Melbourne (the Port) is Australia's largest container, automotive and general cargo port, and demand for port services is predicted to grow in line with population growth and increases in interstate and international trade.⁵⁴ Forecasts point to a 50 per cent increase in the annual number of commercial vessel visits to the Port expected between 2019 and 2050, driving demand for workers in this sector.⁵⁵

Warehousing and storage services

The online shopping boom has required both small and large companies to accelerate their capacity to deliver in the eCommerce market. This has flow-on effects with the need for additional facilities to store their stock locally.⁵⁶ The Port of Melbourne forecasts that total container trade volumes will grow over the long-term by 3.5 per cent per annum, from 3 million twenty-foot equivalent units (TEU) in 2019 to around 8.9 million TEU by 2050.⁵⁷

New technologies are driving significant change in the sector. Artificial intelligence, the Internet of Things, blockchain and analytics technologies are being deployed to minimise labour, optimise warehouse operations and better predict consumer demand. This will allow warehousing companies to better determine the services that will be needed and the locations that will be required.⁵⁸

An increased interest from companies in reverse logistics and closed-loop supply chains is helping to reduce carbon emissions and improve air quality.⁵⁹ Businesses that adapt to this change are likely to see increased demand as environmental impacts increasingly influence consumer purchasing decisions.⁶⁰

Workforce and skilling implications

An estimated 25,500 new workers are required to meet projected demand over the next 3 years

On average, across all industries total employment is expected to grow by an additional 211,900 workers to 2025, from 3,538,900 workers in 2022, an annual growth rate of 1.97 per cent^{f,61,62} In comparison between 2017 and 2020 employment grew by 2.68 per cent^g annually.⁶³

In the transport, postal and warehousing industry, employment is expected to grow by an additional 14,400 workers to 2025, from 184,500 workers in 2022, an annual growth rate of 2.35 per cent^h which is higher than the overall Victorian average across all industries.^{64,65} In comparison between 2017 and 2020 employment across this industry grew by 7.31 per centⁱ annually.⁶⁶

The 25,500 new workers needed between 2022 and 2025⁶⁷ comprises 14,400 employment growth and replacement of 11,100 retirees.⁶⁸ The number of retirements does not consider people leaving the industry for other reasons.

Population growth is driving demand for various type of drivers (automobile, truck, forklift), couriers and postal workers and warehouse workers. Larger organisations are seeking to expand their businesses and maximise efficiency, requiring more complex roles to manage logistics operations. This is driving the need for other managerial occupations, such as supply and distribution managers and procurement managers.

Table 5 identifies the top ten occupations in demand across the industry to 2025. Of these, six occupations (highlighted in table) are expected to experience employment growth at a rate above the overall Victorian average between 2022 and 2025. These figures are estimates and they may be underestimated as they do not account for existing vacancies, nor take account of changes in the rate of workers leaving the industry.

Table 5 | Occupations in demand in the transport, postal and warehousing industry to 2025^{j,69,70}

Occupation	Current employment	Employment growth (2022–25)		Retirements (2022–25)	New workers needed (2022–25)
		Number	Per cent		
Truck drivers	26,500	1,150	1.3%	1,850	3,000
Bus and coach drivers	9,450	900	2.4%	900	1,800
Automobile drivers	14,800	1,150	2.8%	550	1,700
Storepersons	12,750	850	2.5%	600	1,450
Delivery drivers	10,900	850	3.1%	600	1,450
Couriers and postal deliverers	8,700	250	0.6%	700	900
Air transport professionals	3,800	600	6.7%	200	800
Mail sorters	5,000	400	2.4%	400	750
Forklift drivers	8,700	350	1.9%	350	700

^f 3-year compound annual growth rate

^g Computed for 2017 to 2020 employment growth for pre-COVID comparison


^h 3-year compound annual growth rate

ⁱ Computed for 2017 to 2020 employment growth for pre-COVID comparison

^j Due to rounding, some totals may not correspond with the sum of the separate figures

Transport and despatch clerks	8,050	300	1.5%	350	650
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Legend

 Above Victorian employment growth average between 2022 and 2025

New occupations are emerging in the transport industry primarily due to the development of new technologies and innovations. Drones can perform several tasks across the freight sector, including warehouse operations, last-mile delivery and act as unstaffed air cargo planes, requiring more drone operators and pilots. Mechanics and machinery repairers will need to be available to support their operations but also many other autonomous vehicles in controlled environments, such as airports, warehouses and industrial sites.

The transition to zero emission vehicles options (for example, battery electric, hydrogen fuel cell) will also demand a new set of skills for mechanics and machinery repairers.⁷¹ The newest planes, trains, ships, ports and tracks will generate substantial amounts of data and analysing this data will require the work of data scientists.⁷²

More senior roles, such as procurement managers, distribution centre managers, supply chain managers and process automation specialists will be required for companies to accelerate their capacity in the eCommerce market, with the flow on for additional local storage.

At a sub-sector level, roles across the maritime industry are emerging due to the rise of technology-based operational systems such as Dynamic Positioning (DP) systems.

Emerging occupations are defined as new, frequently advertised jobs which are substantially different to occupations already defined in ANZSCO.⁷³ It also includes roles where the number of positions available will continue to grow in the future. Emerging occupations are listed in Table 6.

Table 6 | Emerging occupations in the transport industry⁷⁴

Emerging occupations	
• Blockchain engineers ⁷⁵	• Data scientists ⁷⁶
• Drone operators and pilots ⁷⁷	• Mechanics and machinery repairers ⁷⁸
• Operators and maintainers of Australian vessels with Dynamic Positioning (DP) systems ⁷⁹	• Process automation specialists ⁸⁰
• Robotics engineers ⁸¹	• Supply, distribution and procurement managers ⁸²

Existing occupation shortages span from entry-level to managerial roles

Current occupation shortages need to be addressed to meet projected demand. A shortage exists when employers are unable to fill or have considerable difficulty filling vacancies for an occupation at current levels of remuneration and conditions of employment, and in reasonably accessible locations. Where an occupation specialisation is in shortage, the occupation will be treated as in shortage. A list of current occupation shortages related to the transport industry is shown in Table 7.

Many shortages relate to drivers, with a recent survey of 75 Victorian operators revealing that 95 per cent were experiencing shortages – totalling nearly 1,800 vacancies.⁸³ Industry has identified several reasons for these shortages, including low awareness of the industry and the diverse range of opportunities it can provide.

Other ongoing challenges include insecure employment opportunities and poor work conditions that risk safety. These create negative perceptions and deter people from entering the industry. Many workers in the aviation industry have also transitioned out of the industry during COVID-19 due to insecure employment.

Table 7 | Occupation shortages in the transport industry

Occupation shortages	
• Engineers ⁸⁴	• Harbour masters ⁸⁵
• Marine pilots ⁸⁶	• Port managers ⁸⁷
• Railway track workers ⁸⁸	• Signalling specialists ⁸⁹
• Stevedores ⁹⁰	• Train controllers ⁹¹
• Train and tram drivers ^{92k}	• Transport services managers ^{93k}
• Truck drivers, especially acute for heavy and multi combination vehicles ⁹⁴	
Additional occupations as part of the National Skills Commission's updated Skills Priority List released on 06 October 2022⁹⁵	
• Bus driver	• Railway track plant operator
• Aircraft baggage handler and airline ground crew	• Marine surveyor
• Ship's officer	• Ship's master
• Master fisher	• Ship's engineer

Shortages will have flow-on impacts not only to businesses in the sector but to supply chains for other industries. For example, Victoria's rolling stock strategy – building locally manufactured trains and trams – itself relies on logistical support to supply necessary goods.

Some skills are in immediate shortage, while others will increase in demand

Key skills to work in the transport industry include driving, health and safety, operational skills, compliance and digital skills.⁹⁶

Emerging challenges faced by the industry include an ageing workforce that is increasing skills gaps as existing workers retire, particularly in leadership and management roles. In addition, the importance of safety and fatigue management, particularly among drivers, has become more recognised as the sector seeks to address higher rates of injury relative to other industries.

Skills in the use of robotics and data analytics are delivering innovation and value by improving the speed and accuracy of routine operations, particularly in warehousing.⁹⁷

The shortage in these skills is in part driven by the pace of change in the industry, combined with the time taken to develop these new skills. Skills such as cyber security and engineering are in shortage across the entire workforce, with the industry having to compete with other industries offering competitive salaries. Table 8 identifies the range of skills in shortage across the transport industry.

^k This occupation was removed in the 2022 Victoria Skills Shortage list from the National Skills Commission but was in the 2021 shortage list.

Table 8 | Skill shortages facing the transport industry

Skill shortages	
• Customs brokers ⁹⁸	• Cyber security ⁹⁹
• Data analytics ¹⁰⁰	• Engineering ¹⁰¹
• Leadership and management skills ¹⁰²	• Marketing ¹⁰³
• Problem-solving capability and initiative ¹⁰⁴	• Risk ¹⁰⁵
• Robotics ¹⁰⁶	• Safety and fatigue management skills, especially in transition from heavy rigid to multi combination vehicles ¹⁰⁷
• Truck driving ¹⁰⁸	

While some of these skills are required immediately, others will be needed more in the future. Emerging skills also often relate to skills in shortage due to the lag between demand and workers developing the new skills (see Table 9).¹⁰⁹ This lag comes from the delay in demand becoming widespread enough that the workforce has time to respond, and in the time taken to train and develop the relevant skills.¹¹⁰

The pace of change in the transport industry will have implications for the existing workforce which will be required to upskill in areas such as artificial intelligence, machine learning, data analytics and robotic skills. Some skills are related to specific occupations, such as truck drivers who have traditionally worked in isolation or with minimal customer interaction. The uptake of automated trucks means the job will involve more human interactions as they work from a control centre with other automated truck operators.¹¹¹

“Upskilling is paramount, but we need to make sure workers are capable and interested. Fear is a factor – most of the existing workforce didn’t grow up with computers in school.”

Skills Plan Consultation, Transport and Logistics Industry Advisory Group, March 2022

Many other new emerging skills centre on the introduction of drones and autonomous vehicles and devices in controlled environments, such as airports, warehouses and industrial sites. Other skills respond to societal shifts such as companies becoming more focused on environmental and sustainability goals.¹¹²

Table 9 | Emerging skills in the transport industry

Emerging skills	
• Ability to meet the challenge of sustainability and ethical demands. ¹¹³	• Artificial intelligence and machine learning. ¹¹⁴
• Capability to operate advanced air mobility (AAM) and electric Vertical Take Off and Landing (eVOTAL) vehicles. ¹¹⁵	• Customer service skills for delivery drivers. ¹¹⁶
• Data analytics and robotics skills. ¹¹⁷	• Fleet and hub management. ¹¹⁸
• Maintenance, repair and replacement of electrical and refrigeration equipment. ¹¹⁹	• New competencies associated with predicting faults associated with sensors and electronics under train carriages or on rail tracks. ¹²⁰

<ul style="list-style-type: none"> • Operation of semiautonomous and autonomous machines in controlled environments, as well as working in robotic warehouses.¹²¹ 	<ul style="list-style-type: none"> • Safe operation of drones and compliance with regulations.¹²²
<ul style="list-style-type: none"> • Skills in maintenance of electric and hydrogen-based vehicles and high frequency mass transit.¹²³ 	<ul style="list-style-type: none"> • Skills to minimise the risk of cyber-attacks and be capable of reinstating digital systems as quickly as possible if a cybersecurity incident occurs, including compliance with regulatory compliance.¹²⁴
<ul style="list-style-type: none"> • Skills to select, analyse and interpret the vast amounts of data that sensors, drones and other devices provide.¹²⁵ 	

Education and training pipeline

There were close to 16,730 enrolments in transport related VET qualifications in 2020 and over 1,520 relevant enrolments in Higher Education in 2019.^{126,127} This should translate to close to 14,310¹ graduating students entering the workforce each year with relevant qualifications, presenting a significant opportunity to meet the projected demand, although some will seek employment in other industries. For further detail, see the collaborative response toward the end of this report.

The transport industry provides many opportunities for entry-level workers with no formal qualifications

The transport industry provides many opportunities for entry level workers. Nearly half (47.8 per cent) of the total workers in this sector do not hold a post-school qualification.¹²⁹ Many skills required to work in the industry are learnt on-the-job and employers often provide training during employment as needed (e.g., upskilling in new technology). The industry is most popular for males, workers aged over 50 and migrants.

In 2020, there were close to 1,450 apprentices or trainees' enrolments in transport related VET qualifications.¹²⁸

Many workers in this industry are also required to obtain relevant licences. Licensing can relate to activities such as driving a forklift, dogging and rigging, and operating a boiler steam turbine or reciprocating steam engine. Tickets can include working at heights, working in confined spaces and traffic management. In transport, it is common for young workers (under 23 years old) and packers to first obtain their medium rigid licence (as a freight hauler) before undertaking the necessary steps to obtain more advanced licences (e.g., heavy rigid, heavy combination). Key roles include tanker drivers for dairy, general freight haulers and oversized truck drivers for construction.

In 2020, there was one skill set subsidised through the Victorian Government's Funded Course List (FCL): Course in Transport and Logistics Employment Pathway. This course is intended to provide a pathway into the transport industry for young people and school leavers. There are many other skill sets delivered by individual employers feeding into the transport sector that are not part of the Victorian FCL and therefore not captured in Table 10. Training is often conducted in-house by experienced employees and workers may be required to obtain additional licences to attend and perform certain types of work on-site. Examples include the high-risk work licence, licence to transport explosives by road and rail and the dangerous goods vehicle licence.

VET Activity

People enrol in VET courses for one of three main reasons:

- to prepare for employment
- to support current employment
- to progress their careers within the industry.

VET activity can be categorised as prior to employment, with employment (as an apprenticeship or traineeship), and upskilling once qualified as shown in Table 10. The table shows the enrolments in 2020 in VET courses on the Victorian Funded Course List (FCL) and the Victorian Funded Skill Set List (FSSL).^{130,131} related to this industry. The enrolment numbers are drawn from Total VET activity (TVA) which comprises enrolments supported by public funding or by private contribution.

¹ This number is determined by taking the total number of VET enrolments in courses undertaken prior to employment, combined with 1/3 of the total number of HE enrolments in AQF 5-8 courses (as these courses are traditionally undertaken prior to employment and the average bachelor degree is three years, so therefore only those in their final year of study will enter the workforce the following year).

As part of preparing this report, industry representatives have provided their perspectives on the purpose of these qualifications. Course purpose is summarised in Figure 2 and helps to read Table 10.

Figure 2 | VET pipeline key

1. 'AT' indicates a classroom-based course is also available as an apprenticeship or traineeship option
 2. 'Q' indicates industry values the course as a qualification
 3. 'SS' indicates industry values the course as a skill set
 4. 'EIR' indicates it is an Endorsed Industry Requirement as noted by industry
 5. 'OL' indicates the course leads to an Occupational Licence as noted by industry
- Note: Industry has not provided feedback on all qualifications and where indicated; each value assignment can be reviewed in the future.

Table 10 | VET pipeline for the transport industry in Victoria^m

Prior to employment	
Qualifications (13,869 TVA enrolments 2020)	
Certificate I	10
Certificate I in Maritime Operations (Coxswain Grade 2 Near Coastal) (Q,OL)	10
Certificate II	2,695
Certificate II in Maritime Operations (Coxswain Grade 1 Near Coastal) (Q,AT,OL)	135
Certificate II in Maritime Operations (Marine Engine Driver Grade 3 Near Coastal) (Q,OL)	17
Certificate II in Rail Infrastructure	1,459
Certificate II in Supply Chain Operations (Q,SS,AT)	1,084
Certificate III	10,353
Certificate III in Aviation (Cabin Crew) (SS)	65
Certificate III in Driving Operations (Q,SS,AT,OL)	6,319
Certificate III in International Freight Forwarding (Operator) (Q,AT)	31
Certificate III in Maritime Operations (Marine Engine Driver Grade 2 Near Coastal) (Q,AT,OL)	36
Certificate III in Maritime Operations (Master Inland Waters) (Q,OL)	<5
Certificate III in Maritime Operations (Master up to 24 metres Near Coastal) (Q,AT,OL)	62
Certificate III in Rail Customer Service (AT)	198
Certificate III in Supply Chain Operations (Q,SS,AT)	3,639
Certificate IV	811
Certificate IV in Maritime Operations (Master up to 35 metres Near Coastal) (Q,OL)	10
Certificate IV in Train Driving (AT)	511
Certificate IV in Transport and Logistics (Road Transport - Car Driving Instruction) (Q,OL)	268
Certificate IV in Transport and Logistics (Road Transport - Heavy Vehicle Driving Instruction)	22
Skill Set	0
Course in Transport and Logistics Employment Pathway (Q)	0

^m VET courses can support a range of occupations across a range of industries, and occupations can also support a range of industries. To present the likely VET trained employment pipeline by industry, enrolments for a course have been assigned to the most common industry in which people seek employment.

With employment (apprenticeship and traineeship)	
Qualifications (1,449 TVA enrolments 2020)	
Certificate II	468
Certificate II in Supply Chain Operations (Q,SS)	468
Certificate III	838
Certificate III in Driving Operations (Q,SS,OL)	330
Certificate III in International Freight Forwarding (Operator) (Q)	56
Certificate III in Maritime Operations (Marine Engine Driver Grade 2 Near Coastal) (Q,OL)	<5
Certificate III in Maritime Operations (Master up to 24 metres Near Coastal) (Q,OL)	<5
Certificate III in Rail Infrastructure	20
Certificate III in Supply Chain Operations (Q,SS)	428
Certificate IV	143
Certificate IV in Supply Chain Operations (Q)	137
Certificate IV in Train Driving	6
Upskilling once qualified	
Qualifications (1,411 TVA enrolments 2020)	
Certificate III	166
Certificate III in Mobile Crane Operations (AT,OL)	43
Certificate III in Rail Infrastructure (AT)	123
Certificate IV	461
Certificate IV in Mobile Crane Operations (AT)	68
Certificate IV in Specialist Driving Operations (Q,OL)	294
Certificate IV in Supply Chain Operations (Q,AT)	99
Diploma	784
Diploma of Aviation (Commercial Pilot Licence - Aeroplane) (OL)	381
Diploma of Logistics (Q,AT)	403
Note: Enrolment figures in this table are as reported by NCVER, Total VET student and courses 2020: program enrolment. There may be instances where program enrolments are not reported by providers to NCVER and therefore not included in the enrolment figures in the total VET training activity data. Total VET activity for 2021 is expected to be released in August 2022.	

While a number of qualifications are also valued for skill sets, for the Certificate III in Aviation (Cabin Crew), industry indicated a preference to make this qualification available as a skill set rather than a qualification. There are already instances where training is delivered through private providers and/or employers outside the formal qualification.

Stakeholders identified four additional qualifications currently available that are also utilised to provide skill sets for the industry. These qualifications were: Certificate III in Driving Operations; Certificate III in International Freight Forwarding (Operator); Certificate II in Supply Chain Operations and Certificate III in Supply Chain Operations. Further consultation and review can determine appropriate changes moving forward.

Higher education is expected to become increasingly important with new technologies in the industry

Higher education also supports some pathways into the transport industry, with 19 per cent of workers holding a degree or above as their highest level of education.¹³² Example occupations requiring a higher education qualification include air transport professionals, aircraft maintenance engineers and marine transport professionals. Industry noted that there will be an increasing reliance on higher education related qualifications in the future as new technologies and processes emerge.¹³³

In 2019, there were over 1,520 equivalent full-time study load (EFTSL) across transport related higher education courses in Victoria that directly build the pipeline of workers in this industry.¹³⁴ There are also other general higher education pathways that support people to work in the industry due to its close intersection with many other industries. The higher education pipeline for this industry is shown in Table 11. Only courses relevant to the transport industry are included as examples.

Table 11 | Pipeline for the transport industry in Victoria, according to narrow field of study¹³⁵ⁿ

Aerospace Engineering and Technology (1,347 EFTSL, Victoria, 2019)	
Australian Qualifications Framework (AQF) 9+ (e.g., Master and above) (127 EFTSL) Examples include: <ul style="list-style-type: none"> • PhD (Aerospace Engineering) (61) • Master of Science (Aviation) (33) • Master of Aviation (8) 	AQF 5-8 (e.g., Diploma, Bachelor, Hons) (1,220 EFTSL) Examples include: <ul style="list-style-type: none"> • Bachelor of Applied Science (Aviation) (367) • Bachelor of Engineering (Aerospace Engineering) (362) • Bachelor of Aviation (147)
Civil Engineering (relevant courses only) (56 EFTSL, Victoria, 2019)	
AQF 9+ (e.g., Master and above) (56 enrolments) <ul style="list-style-type: none"> • Master of Transportation Systems (38) • Master of Transport and Traffic (13) • Master of Transport (<5) • Master of Engineering (Transport Systems Engineering) (<5) 	AQF 5-8 (e.g., Diploma, Bachelor, Hons) (0 enrolments) <ul style="list-style-type: none"> • n/a
Management and Commerce (relevant courses only) (121 EFTSL, Victoria, 2019)	
AQF 9+ (e.g., Master and above) (23) <ul style="list-style-type: none"> • PhD (Supply Chain and Logistics) (23) 	AQF 5-8 (e.g., Diploma, Bachelor, Hons) (98 enrolments) <ul style="list-style-type: none"> • Graduate Certificate Supply Chain and Logistics Management (52) • Bachelor of Business (Logistics and Supply Chain Management) (46)

ⁿ A course may be allocated to different narrow field of educations by different higher education providers based on the primary purpose of the course. Higher education enrolments reported against a course under a specified narrow field of education reflect only the portion of enrolment allocated to the narrow field of education and are not reflective of the total enrolment for the course.

Workforce priorities

Building the pipeline of workers available in parallel to upskilling the existing workforce are key priorities

Key challenges exist to addressing the supply and skill of labour across the transport industry. Challenges concern regulation related to workforce entry requirements, particularly licensing for heavy and multi combination vehicles, a lack of trainers to deliver the required training, an ageing workforce and low awareness of the industry and employment opportunities. Three key priorities for the transport industry are identified.

Support workers to have the skills and experience to operate safely

For a large part, the transport industry relies on licensing and skills to build their pipeline of workers rather than full qualifications. Industry noted challenges with the existing licensing scheme for heavy and multi combination vehicles that does not prepare workers with the adequate skills and competencies to work in the role. At present, there is limited formal training required to gain a licence and there is no pathway to become a professional driver. This presents a risk for both the employee in the role, the employer and the broader community. Improving the quality of the licensing scheme while also ensuring the process is achievable for workers is a key priority moving forward.

Table 12 | Areas of focus to increase the number of drivers available with the skills and experience to operate safely

- Limited practical work experience is required to gain a heavy or multicomination vehicle licence.
- Existing driving qualifications and training do not prepare workers with the adequate skills and competencies.
- There are no formal training/bridging opportunities for individuals to be recognised as professional drivers.

“Do not underestimate the impact of the gig economy (e.g., Uber) on the infrastructure and broader Victorian economy, such as safety, employee recruitment and driver behaviour”

Skills Plan Consultation, Transport and Logistics Industry Advisory Group, December 2021

Manage the workforce transition in line with the rapid adoption of new technology and processes, driving new skill requirements

A shift towards new technologies and processes is creating demand for new skill sets and making some skills redundant. Industry noted that this transition is likely to occur at different points across different sectors within transport. For example, autonomous driving vehicles are being seen in controlled environments, such as airports, warehouses and industrial sites, while the transition to uncontrolled environments, such as roads, is likely many years away. Industry also noted that many of the new roles require a completely new skill set and potentially a more highly skilled person (including mechanics for traditional vehicles and technicians required for digitally run vehicles). This has created a hesitancy for change among the existing workforce highlighted by employers. Forward planning is needed to prepare for this transition, involving effective partnerships between industry and education providers to ensure the right skills training is provided at the right time.

Table 13 | Areas of focus to manage the workforce transition

- There are few mechanisms in place to support the existing workforce to transition.
- Some roles will require a completely new skill set and potentially a more skilled worker.
- The workforce transition is likely to occur at a staggered and inconsistent pace across industry.

Support training of workers for niche but critical roles and explore ways to attract underrepresented cohorts

Industry noted challenges in accessing training for critical roles that have low volume enrolments. Example occupations include harbour masters, maritime pilots and stevedores. This presents a challenge for the VET sector in providing training for small cohorts which may not meet the threshold to be financially viable for training providers. Both industry and the education and training system may be able to respond to these needs through new partnerships that deliver cost effective, just in time training valued by industry.

Table 14 | Areas of focus to build the pipeline of workers for low volume but critical roles

- There are limited training pathways and options in occupations with shortages such as stevedores and harbour masters.
- Education providers struggle to deliver courses that are financially viable with limited enrolment numbers.
- Training needs to be aligned with contemporary industry needs.

“There are only two or three companies that do stevedoring (in Victoria) so it might not be appropriate for the education and training system alone to train those workers. We need to be able to dynamically respond”

Transport and Logistics Skills Plan Consultation, Industry Advisory Group, March 2022

Collaborative response

There are opportunities for education and training to explore new approaches to delivering training and recognising skills

The education and training response has a key role to play in helping to address the three key workforce issues for the industry:

1. Support workers to have the skills and experience to operate safely
2. Manage the workforce transition in line with the rapid adoption of new technology and processes
3. Support training of workers for niche but critical roles and explore ways to attract underrepresented cohorts.

Prior to employment, there is an opportunity for the education and training sectors to expand interest and awareness in transport related roles to build the pipeline of workers. Attention can focus on reaching currently underrepresented groups in the transport industry, particularly women. For example, a recent report found that only 48 per cent of the broader community believe the heavy vehicle industry is equally suitable for men and women.¹³⁶ More can be done to enhance the image of the industry. One approach involves local employment services with job-skills matching and pathways for diverse groups. An example of where this is already working is via the Jobs Victoria Innovation Projects, which support businesses and industries to recruit the staff they need through connecting them with candidates and assisting with funds to recruit, train and support eligible employees.¹³⁷

Case Study | Supervisor Heavy Vehicle Licensing program for women at Wodonga TAFE

Wodonga TAFE in partnership with Transport Women Australia Limited (TWAL) and Volvo Group Australia started the first Supervisor Heavy Vehicle Licensing (SHVL) program for women. The program is designed to increase the participation of women in driving roles as part of the solution to address the shortage of drivers across this sector. The program aims to bridge the gaps between licensing standards and industry requirements but covering areas not covered in licence instruction, such as health and safety procedures, road maps, fatigue management and technology. This program has been successful in attracting and training prospective drivers that may not have otherwise entered the industry.

There is also an opportunity for the education and training response to explore new training offerings that ensure licensed drivers have the skills to operate safely on-site. Any training provided can ensure workers have an appropriate time operating the machine in practice. The response can review the existing licensing requirements and determine whether additional skill sets are required. Industry stakeholders are already in the process of proposing options. One response already underway is the new truck driving apprenticeship (proposed by the Australian Government) to meet future workforce challenges. The new national apprenticeship, Certificate III in Driving Operations, will see the industry in conjunction with states and territories develop a qualified apprenticeship for the first time.

The education and training response can seek to support the training of specialised but low volume occupations. For example, harbour masters, maritime pilots and stevedores. This response can explore new models to train these specialist occupations and roles to meet industry demand, such as through the delivery of micro-credentials rather than a full qualification. This will require close partnership with industry which may prefer to provide the training on-site with support from VET to increase the likelihood of participation in the course. For example, 49 per cent of current drivers believe the cost of obtaining a licence can be a barrier to entry.¹³⁸ The education and training response can also work to ensure these skills are formally recognised, which can in turn improve employee confidence and retention.

Focus on market sizing and supporting the workforce to transition into new roles

The transport industry identified it needs to improve how it attracts, develops and utilises talent to meet current and future workforce demand. Opportunities for action include undertaking market sizing activities to help with forward planning, building the supply of labour through licensing and migration and supporting the transition to clean energy. This can be underpinned by supporting improved conditions for workers.

Market sizing is important to determine the true size of the transport workforce, which is currently not directly captured in the data. This will have implications for population growth, particularly in regional areas, alongside government investment in transport related projects who compete for a similar pool of workers. Government and industry can work together to understand the true size of transport-related activities performed in other industries to adequately forecast and plan for the workforce required.

“If we don’t get this right (the number of people who actually work in the industry), we won’t get transport and logistics properly heard at a policy level”

Skills Plan Consultation, Industry Advisory Group, December 2021

Reviewing existing licensing requirements for some roles and implementing any required changes will ensure workers have the appropriate skills while also building the pipeline of workers.

Some drivers in the transport and logistics sector currently face poor and unsafe working conditions, such as fatigue associated with longer working hours. This is in part linked to the rapid emergence of the ‘gig’ economy and minimal practical training requirements to enter the industry. Industry can support the education and training response by leading key reforms focused on working conditions and employee benefits to create a more safe, inclusive workplace. This, in parallel to the government continuing to explore the regulation of new models such as Amazon, can provide better support to drivers.

The transition to clean energy has a key role to play. This includes the transition to electric vehicles and increasing the use of hydrogen. This is creating demand for new skills while making other skills redundant. Industry noted that this transition will occur in different phases for different aspects of the sector. For example, the adoption of autonomous vehicles in controlled environments such as airports, warehouses and industrial sites will occur first. The adoption in uncontrolled environments such as roads is likely to take longer. This shift is also likely to impact services that support transport related business first (e.g., Information Technology). Effective partnerships between industry, education providers and government can drive forward planning to ensure existing workers are transitioned at the right time and/or new workers are adequately supported into roles that require different skill sets.

A proposed set of actions for education, government and industry to consider are shown below.

Actions for consideration for education, industry and government

- Expand interest and awareness of transport related occupations for under-represented groups in the industry (e.g., females) and explore clear pathways into these roles.
- Review licensing requirements to ensure drivers have the skills to safely operate a vehicle.
- Review training provision in thin (low enrolment) but critical markets to the Victorian economy.
- Collectively work to understand the true size of the transport workforce to ensure adequate workforce planning.
- Explore ways of improving working conditions for employees.
- Manage the industry transition to meet different rates of change across the sector.

Appendix A | Drivers of demand

Driver	Industry / Sector
Policy	<p>Postal and courier services</p> <ul style="list-style-type: none"> \$5 million investment to create new standards aimed at providing more protection for gig economy workers.¹³⁹ <p>Transport and support services</p> <ul style="list-style-type: none"> \$80 billion investment in major transport infrastructure (e.g., Regional Rail Renewal, North East Link, West Gate Tunnel, level crossing removals and road upgrades).¹⁴⁰ \$100 million Zero Emissions Vehicle (ZEV) Roadmap. With \$5 million for a fast-charging network and \$3 million in new charging grants for local council and business fleets.¹⁴¹ \$20 million Hume Hydrogen Highway program (\$10 million each from Victoria and NSW) to develop a network of renewable hydrogen refuelling stations along the Hume Highway between Melbourne and Sydney and a fleet of approximately 25 hydrogen trucks to utilise the network.¹⁴² Development of Inland Rail connecting Melbourne and Brisbane via regional Victoria, New South Wales and Queensland.¹⁴³ \$31.4 million investment in upgrades to freight routes to vital South-west dairy supply chain.¹⁴⁴ \$125 million Port Rail Transformation Project following a 14.6 per cent increase in containers in the 2020/2021 financial year compared to 2019/2020.¹⁴⁵ \$613 million to support reliability of V/Line services. Regional Network Development Plan to deliver increased train services to key regional centres.^{146,147} Review of the Heavy Vehicle Licensing System.¹⁴⁸ Changes to <i>Victorian Owner Drivers and Forestry Contractors Act 2005</i> granting stronger payment and conditions.¹⁴⁹ Heavy Vehicle Safety Initiative (HVSI) federal funding supports projects that deliver tangible improvements to heavy vehicle safety.¹⁵⁰
Economic	<ul style="list-style-type: none"> Effect of the gig economy including recent disruptor Amazon – ‘Flex’ own car deliveries and garage warehousing. The global supply chain has been significantly affected by the pandemic and strict lockdown measures in many countries.¹⁵¹ There are unprecedented demands for critical products, and the industry has encountered mail and parcel delivery delays and shortages of products. The Victorian Government has developed a new Victorian Commercial Ports Strategy as a key response to the Independent Review of the Victorian Ports System. The Strategy provides the overarching vision for the port system that clearly articulates the State’s economic and resilience opportunities and how this intersects with port operations. It also investigates port planning settings and economic outlook, and identify next steps, as appropriate, to deliver on these targets for the next 30 years. The Strategy was released in 2022.¹⁵² <p>Transport and support services</p> <ul style="list-style-type: none"> Businesses increasingly integrating transport services across their operations. Businesses have insufficient capital to update their fleet, exacerbated by cost of vehicle imports, resulting in higher maintenance demand. <p>Warehousing and storage services</p> <ul style="list-style-type: none"> Global logistics company investing \$147 million to double size of cold storage facility in Truganina.¹⁵³

Driver	Industry / Sector
Social	<ul style="list-style-type: none"> • Pandemic has driven a rise in eCommerce, and services relating to packaging, transport and delivery of goods. National average of online purchases increased by 41 per cent in 2020 and continues to grow strongly.¹⁵⁴ • The issue of mental health in the industry has become more prominent recently and has been exacerbated by the increased workload across some sectors due to COVID-19.¹⁵⁵ To effectively mitigate the risks associated with mental health, with cohesive and standard policies and regulations need to be introduced across all sectors.¹⁵⁶ • The industry has an ageing workforce, 36.2 per cent of workers in this sector are aged over 50 (47,106 people), which is higher than the national average across all sectors of 29 per cent.¹⁵⁷ There is a risk the industry will have a workforce supply chain crisis within the next 10-15 years as the older workers retire.¹⁵⁸ • A significant spike has occurred in the number of people relocating to regional Victoria, driving demand for services.¹⁵⁹ <p>Transport and Support Services</p> <ul style="list-style-type: none"> • Growth in urban sprawl likely to increase demand for automobile drivers (taxi and delivery). • Advocacy for improved mental health in the transport industry, including the Healthy Heads in Trucks & Sheds program. Almost one in two workers in the sector will experience a mental health issue, of those, 40 per cent caused or exacerbated by their work.¹⁶⁰ <p>Warehousing and storage services</p> <ul style="list-style-type: none"> • The increased demand in online shopping and panic buying during the early stages of COVID-19 has required both small and large companies to accelerate their capacity to deliver in the eCommerce market, with the flow on effects of the need for additional facilities to store their stock locally and to process deliveries and increased postal deliveries.¹⁶¹
Technological	<p>Postal and courier services</p> <ul style="list-style-type: none"> • Rising consumer expectations for the rapid and trackable delivery of goods. • Increased investment in supply chain technologies, warehouse logistics such as AI, robotics, real-time monitoring, autonomous delivery of 'the last mile', spatial and mapping, use of sensors.^{162,163} • Rise of drone use and commercial drone operators in delivery of goods. <p>Transport and support services</p> <ul style="list-style-type: none"> • Movement away from diesel mechanics to high-tech software, new-energy technologies: hydrogen, batteries and supercapacitors. • Innovations for airports include automated check-in and bag-drops, biometric technologies and facial recognition, advanced x-ray equipment and Checkpoint Computed Tomography (CT) which can produce a 3D image of the content of bags.¹⁶⁴ • Innovations for airports include automated check-in and bag-drops, biometric technologies and facial recognition, advanced x-ray equipment and Checkpoint Computed Tomography (CT) which can produce a 3D image of the content of bags. Autonomous systems and vehicles can improve safety and automated check-in and baggage drop off can reduce the routine work for ground operators. Airlines have adopted tools such as dynamic airborne rerouting planning, crew scheduling optimisation, predictive maintenance and fuel efficiency software.¹⁶⁵ • Technological innovations in maritime include a Satellite-Based Augmentation System (SBAS), remotely piloted aircraft systems (RPAS), Autonomous Underwater Vehicles (AUV), autonomous container ships and vessels, Dynamic Positioning (DP) systems and e-navigation.¹⁶⁶ <p>Warehousing and storage services</p> <ul style="list-style-type: none"> • Technologies like RFID (Radio Frequency Identification), robots and advanced computer systems are revolutionising the way warehousing is undertaken both in Australia and internationally.¹⁶⁷

Driver	Industry / Sector
	<ul style="list-style-type: none"> Artificial intelligence, machine learning and technologies such as LADAR or Contour Navigation, robotics can minimise labour and optimise warehouse operations. Automated guided vehicles (AGVs) can be used to perform pallet transport, storage and retrieval and drones for stocktaking and inventory management.¹⁶⁸ Internet of Things (IoT) technology is optimising fleet movement, and by combining with data analytics, logistics organisations can create virtual representations of their warehouses.¹⁶⁹ Data analytics and artificial intelligence can assist organisations shift to data driven decision-making by predicting orders based on previous customer behaviour, allowing them to determine which logistic services will be needed and the locations they will be required.¹⁷⁰ The supply chain is diversifying through the use of artificial intelligence, the Internet of Things, blockchain and data analytics to ensure its resilience. As customers use multiple channels for their shopping, omni-channel logistics is growing, and anticipatory logistics is allowing retailers to predict orders.¹⁷¹
Environmental	<ul style="list-style-type: none"> Increasing number of natural disasters affecting the supply chain. <p>Postal and courier services</p> <ul style="list-style-type: none"> Rise of reverse logistics (moving goods from customers back to manufacturers) and closed loop supply chains.¹⁷² <p>Transport and support services</p> <ul style="list-style-type: none"> Victoria’s transport sector pledge: new public transport purchases to be zero-emission-vehicles (ZEV) from 2025, 400 ZEVs added to fleet by 2023.¹⁷³ The Victorian Government has recently invested \$3.6 million to extend the Mode Shift Incentive Scheme to move more freight on rail and reduce heavy vehicle emissions.¹⁷⁴ Under the scheme, approximately 42,500 containers will be moved by rail instead of road, equal to 28,000 truck trips per year.¹⁷⁵

Appendix B Data methodology

VSA Employment Model overview

The VSA Employment Model produces estimates of:

- projected employment growth between 2022 and 2025
- projected retirements between 2022 and 2025
- projected total new workers needed between 2022 and 2025.

Table 15 further defines the model outputs and identifies the primary source for each output.

Table 15 | Employment model outputs

	Employment growth 2022-25	Retirements 2022-25	New workers needed 2022-25
Definition	Change in the number of workers employed from 2022 to 2025	Workers expected to permanently leave the workforce from 2022 to 2025	Workers needed from 2022 to 2025 to meet demand from growing employment and to replace retirees
Primary source	Benchmarked to the NSC Employment Projections	Derived from retirement rates from Australian Census Longitudinal Dataset	The sum of employment growth and retirements

All outputs are modelled at the occupation, industry and region level:

- occupations are defined by 4-digit occupation unit groups in the Australian and New Zealand Standard Classification of Occupations (ANZSCO)
- industries are defined by 1-digit industry divisions in the Australian and New Zealand Standard Industrial Classification (ANZSIC)
- regions are defined by the nine Regional Partnerships of Victoria as outlined by the Victorian Department of Jobs, Precincts and Regions.

Benchmark data from the NSC give estimates of projected employment growth. Using an approach called iterative proportional fitting, the detailed occupation, industry and region breakdowns are generated by applying the distribution of employment in ABS Census and other data to the benchmark projections.

The model was developed by the VSA with the support of Nous and Deloitte Access Economics (DAE). The sections further below describe how the key outputs were modelled.

The VSA Employment Model gives a best estimate of employment by industry, occupation and region. It provides an indication but does not, and cannot, tell the full story of the region's economy.

Employment growth, 2022-25

Source: VSA and Nous (2022), *modelling of NSC (2022) Employment Projections*

This modelling takes the NSC Employment Projections as the benchmark data for 2022-25 and breaks it down into occupation by industry by region tables.

The benchmark data sources provide ‘control totals’ for occupation, industry and region breakdowns independently. However, they do not provide the interaction between each of the variables. For example, they do not give the breakdown of occupations within industries.

Iterative proportion fitting uses a detailed ‘seed’ data table with the necessary breakdowns from a representative dataset and scales that distribution to control totals in the new dataset. Over many iterations, the seed data is transformed to sum up to the occupation, industry and region control totals.

The seed data comes from the ABS Census 2016. The control totals for occupation and industry come from the NSC's Employment Projections, and the control totals for region come from the NSC's Small Area Labour Markets data. Table 16 describes the inputs in detail.

The modelling results in:

- industry and occupation projections that align with the NSC Employment Projections
- regional data that matches the distribution across NSC Small Area Labour Markets
- industry by occupation by region data tables that approximate the distribution within the ABS Census 2016.

Table 16 | Data sources used to model employment growth from 2022 to 2025

Type	Data	Source
Seed	Employment x 3-digit industry (ANZSIC3) x 4-digit occupation (ANZSCO4) x Statistical Area Level 2 (SA2)	ABS, <i>Census of Population and Housing</i> , place of usual residence data
Control total	Employment x SA2	NSC, <i>Small Area Labour Markets</i> , ‘SALM smoothed SA2 Datafiles (ASGS 2016) - March quarter 2022’.
Control total	Employment x ANZSIC1	NSC, <i>Employment Projections, 2020-25</i>
Control total	Employment x ANZSCO4	NSC, <i>Employment Projections, 2021-26</i>

Notes:

1. Following the modelling, SA2 data is aggregated up to Regional Partnership region. Where an SA2 spans multiple regions, the estimates have been apportioned based on geographic area.
2. The NSC industry projection is often not available until some months after the occupation projections. As at May 2022, there were no 2021 to 2026 ANZSIC1 by state forecasts available. The previous release of 2020 to 2025 ANZSIC1 by state forecasts were used and scaled up to match the Australian total employment numbers in the ANZSCO4 forecasts.

Retirements, 2022-25

Source: VSA, Deloitte Access Economics (DAE) and Nous (2022), *Retirement projections 2022-2025*

Retirements are estimated by applying occupation-specific retirement rates to the employment projections.

Using the Australian Census Longitudinal Dataset, an estimate of the size of the labour force aged 50 and over in 2016 was taken and compared to the size of the labour force aged 45 and over in 2011. After adjusting for migration, the gap is an estimate of retirements between 2011 and 2016. The relative age structures of occupations in the Census 2011 were then used to estimate retirements at the detailed occupation level (ANZSCO4).

The outputs were used to estimate an occupation-specific retirement rate, calculated as:

$$\text{Retirement rate} = \text{retirements between periods } t \text{ and } t+1 / \text{employment at } t$$

The retirement rates were applied to the employment projections to estimate the number of retirements between 2022 and 2025 at the region (Regional Partnerships), industry (ANZSIC1) and occupation (ANZSCO4) level.

New workers needed, 2022-25

New workers needed is the simple sum of employment growth and retirements. It is calculated at the region (Regional Partnerships), industry (ANZSIC1) and occupation (ANZSCO4) level.

New workers needed is an estimate of demand for workers to join an industry, occupation or region. In this model, demand comes from growth in employment (as business, government and other employers expand their operations) and the need to replace retirees who leave the workforce.^o

New workers needed is not an estimate of skills shortage. In the VSA Employment Model, demand is always met by supply of new workers who enter the work force from study, unemployment, migration, a change in industry or occupation, or other avenues.

This means that the VSA Employment Model is not suitable for identifying current or future skill shortages. The Victorian Skills Plan draws on the National Skills Commission's Skills Priority List and stakeholder feedback to identify skills shortages within industries and across Victoria.

^o This will generally underestimate demand as it does not account for the need to replace workers who leave a job for other reasons, such as switching occupations or migrating out of Victoria.

Appendix C Victorian VET pipeline methodology

Enrolment numbers

Sources:

National Centre for Vocational Education Research (NCVER) (2021), Total VET students and courses 2020, available [here](#).

Victorian Department of Education and Training (2022), Funded Course List, available [here](#).

Victorian Department of Education and Training (2022), Funded Skill Set List, available [here](#).

The Victorian VET pipeline table estimates the number of enrolments in each qualification and skill set for the 2020 academic year in Victoria. The NCVER total VET students and courses is used as the dataset. Only courses on the Victorian Funded Course List (FCL) and the Victorian Funded Skill Set List (FSSL) are included.

The following steps were taken to develop the table:

1. Each course was reviewed by IAG members and allocated to **only one** of three main reasons for studying: to prepare for employment; to support current employment (apprenticeship or traineeship); and to progress their career. Each course is then listed under their respective allocation.
2. The numbers of students who enrolled in that course in 2020 is then noted in the VET pipeline table.
3. For courses that provide **an apprenticeship and traineeship option and a classroom-based option**, these courses are duplicated twice in the table, with enrolment numbers split across the other two options: the number of apprentice and trainee enrolments are reported under the header 'with employment (apprenticeship and traineeship); the number of classroom-based enrolments is shown under the purpose for completing the classroom-based option (either to prepare for enrolment or to progress their career). An ('^{AT}') is noted next to these duplicated classroom-based courses to indicate they are also delivered as an apprenticeship or traineeship.
4. Where industry has provided feedback on the value of qualification or skill set, a ('^Q') indicates it is valued as a qualification, while a ('^{SS}') indicates it is valued as a skill set. A ('^{EIR}') indicates it is an Endorsed Industry Requirement and ('^{OL}') indicates it is an Occupational Licence. Industry has not provided feedback on all qualifications and where indicated; and each value assignment can be reviewed in the future.
5. Numbers are then totaled in their respective headers above. For the Skills Plan, the number of enrolments 'prior to employment' is a key focus for industry as it indicates how many students are being trained but are not yet employed.

The 2020 enrolment figures are a best estimate of the pipeline of workers for industry to draw on. The 2020 figures were the latest dataset available from the NCVER at the time of developing the Skills Plan and will be updated in future iterations of this document. They intend to provide an indication of the pipeline but do not and cannot tell the full story of workforce supply. Factors such as completion rates and the COVID-19 pandemic during 2020 are also likely to impact the availability of the future workforce.

Appendix D Stakeholder engagement process

Stakeholder engagements allowed VSA to test, update and validate the content of the transport, postal, and warehousing industry insight report. Stakeholders from organisations in government, education and industry were engaged to provide input to the report and the Skills Plan more broadly. Specifically, stakeholders provided insight on economic outlook, workforce and skilling challenges and an education and training response across three rounds of consultations. Engagements guided initial thinking and research, as well as opportunities to test and revise the insights. We would like to thank the following organisations for their participation in the stakeholder engagement process. Table 17 lists the organisations involved.

Table 17 | Consultation participants

Organisation
Aviation/Aerospace Australia
Chartered Institute of Logistics and Transport Australia
Bus Association Victoria
Department of Environment, Land, Water and Planning
Department of Premier and Cabinet
Department of Transport
Freight Victoria, Department of Transport
Maritime Union of Australia
Metro Trains
Office of Projects Victoria
Rail, Tram and Bus Union
Rural and Regional Victoria
Transports and Logistics Industry Advisory Group
Transport Workers Union
Wodonga TAFE
Women in Supply Chain
Victorian Automobile Chamber of Commerce
Victorian Transport Association

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