



# Australian Pallet Survey 2017 Report

**CENTRE FOR SUPPLY CHAIN  
AND LOGISTICS**

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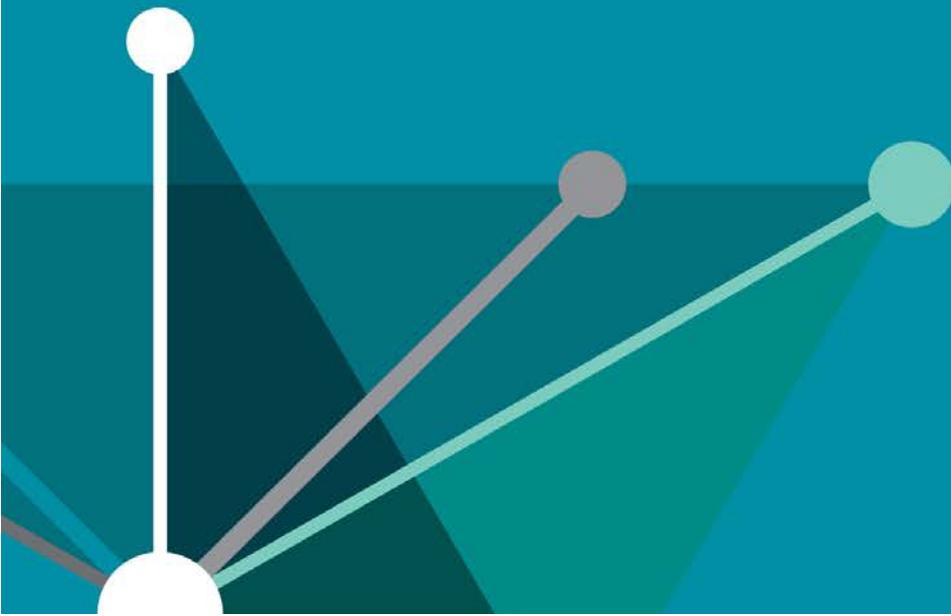
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# SUMMARY OF FINDINGS

# Summary of findings

The Australian Pallet Survey 2017 was conducted in May-June 2017 as an on-line survey. It was supplemented by industry consultations that provided additional insights to the survey questions. 81 Australian businesses responded to this survey, which was deployed through several industry peak bodies.

The pallet is viewed as a necessary piece of equipment with little intrinsic value in relation to the product supply chain. Despite the indication that companies have incurred significant costs through their inability to control and manage pallet usage, they view the device as “a necessary evil” rather than part of the value chain of the product.

This view may be challenged if the trends in pallets identified in this report continue. Key influences will be the cost of the pallet, the whole-of-supply-chain planning for the product, increasing automation in distribution and the insertion of technology to track and trace assets as well as product.

Cost is the prevailing concern of pallet users who rent or buy pallets. The ability to meet customer requirements, strength of the pallets, durability and rack-ability were the further ranked considerations.

Pallet pooling dominates in Australia, globally the most mature pallet market, with two thirds of survey respondents using rental pallets, enjoying flexibility and avoiding the responsibility associated with ownership of the assets. 80 percent of pallets represented in the survey are used in open distribution systems, with product sourced from and supplied to multiple parties.

The survey featured a section on the usage, benefits and issues related to plastic pallets in Australia. Hygiene and avoidance of contamination were primary factors influencing this choice of pallet. Rack-ability and strength were concerns expressed in relation to the use of plastic. 22 percent of surveyed businesses expected to increase their use of plastic pallets in the ensuing two years, driven by customer requirements and regulatory mandates related to the product and workplace safety.

Diversity in pallet sizes is a trend identified. Logistics service providers are finding handling of this variety of sizes a challenge in transport and storage. This issue will need to be addressed as the growth of import pallets, retailer-configured pallets and warehouse automation create a wider array of pallet types.

It is evident from this research that pallet control is a significant challenge for the pallet owner, renter and supplier. Despite considerable cost and effort, the lack of control is resulting in further cost and frustration. It is also evident that companies that have no account with the leasing pools are benefitting from a supply of pallets that are accruing daily rental fees for the supplier and/or transporter of the pallet. While there are technologies available to track and trace the pallet, these have proven too expensive to date to implement. It is unclear whether this is a false economy, given the costs associated with lost pallet inventory and as the technologies become more common.

The Centre for Supply Chain and Logistics appreciates the time given by respondents to support this research.



# INTRODUCTION

# 1 Introduction

In early 2017, the Centre for Supply Chain and Logistics at Deakin University undertook a scan of information available on pallet usage globally and in Australia. The Centre regularly undertakes analysis of freight transport equipment trends (containers, vehicles, vessels etc.) and logistics in general (e.g. cold chain distribution; e-commerce; last mile). What surprised our researchers was the lack of information in the public domain relating to trends and experiences of pallet users in Australia. In the US and EU, regular pallet surveys are conducted, however there are no publicly available surveys in Australia.

The pallet is a ubiquitous unit of transport equipment which is essential to efficient freight transport and storage operations. For many shippers it is seen as a “necessary evil”: a cost of moving or storing their product with little intrinsic value attached to the asset. Our research has shown that the pallet, like all equipment vital to our economic activities, indeed has a value and variety and attracts significant interest not only in the logistics and freight transport realm; it also is of interest to the manufacturers, producers and suppliers who rely daily on this product.

Australia’s pallet marketplace is dominated by a small number of pallet rental companies operating a pool of equipment. The rate of pooled pallet usage is high in comparison with other economies (Freedonia: 2014), so using international data on pallet usage can be misleading in an Australian context.

This research relies on consultations with pallet users and a survey distributed through a number of peak industry bodies, including the Supply Chain and Logistics Association of Australia, the Australian Trucking Association, the Victorian Transport Association, the Supply Chain Advisory Network, Customs Brokers and Forwarders Council of Australia and promoted in the Materials Handling and Transport and Logistics media.

The findings of this research will form a baseline of information on pallet usage in Australia. It will be repeated on a regular basis to identify trends and emerging requirements, which will support further research and knowledge sharing on this vital transport and storage asset.



# SURVEY RESULTS

## 2 Survey results

### 2.1 Industry background of respondent companies

The industry of respondent companies was dominated by the transport, warehousing and postal sector, followed by manufacturing (see Figure 1).

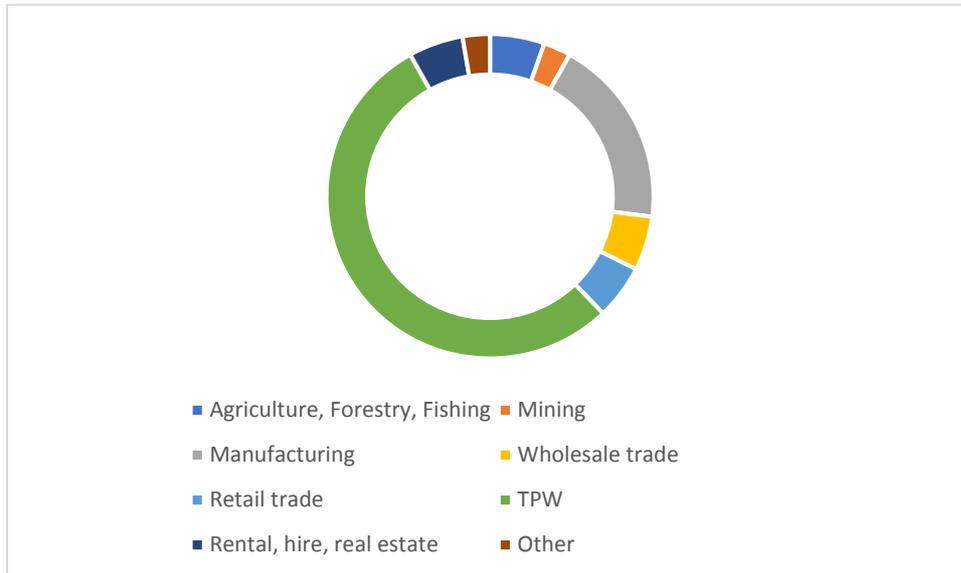


Figure 1: Industry of respondent, Australian pallet survey 2017, CSCL.

(TPW = transport, postal and warehousing)

### 2.2 Company size

The majority of respondents (56%) were companies with turnover less than AUD 50 million, with 38% of companies having fewer than 50 employees (see Figures 2 and 3).

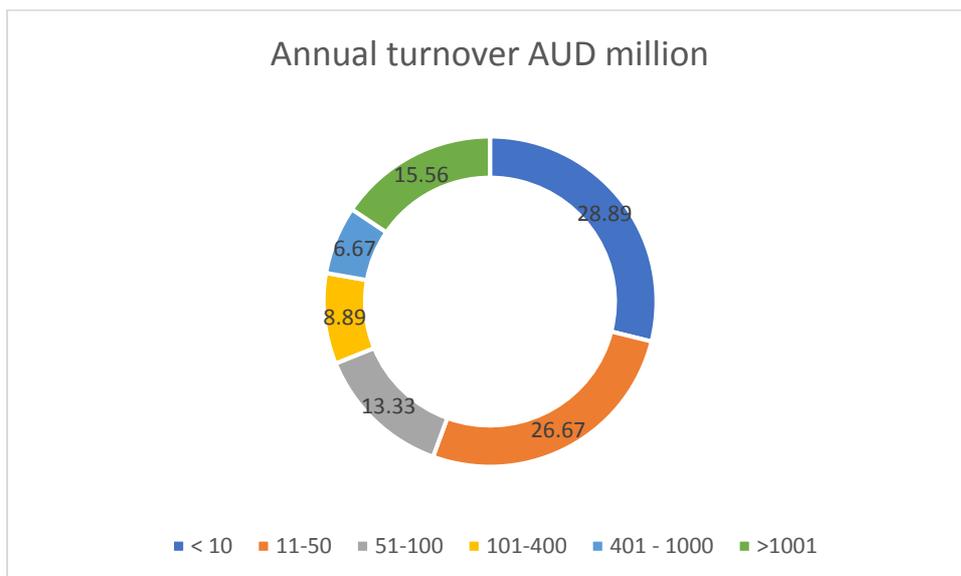


Figure 2: Company annual turnover, Australian pallet survey 2017, CSCL.

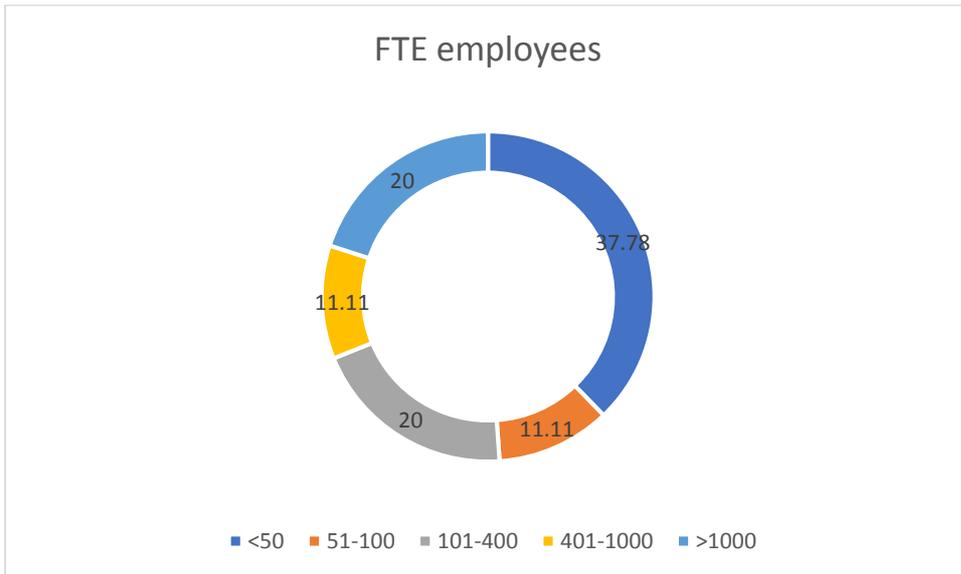


Figure 3: Full time equivalent employees, Australian pallet survey 2017, CSCL.

### 2.3 Location of respondents

More than half the companies had a national footprint, operating in multiple states or territories. Of the balance, 22% were located in NSW, 18% in Victoria, 8% in SA and 2% in QLD.

### 2.4 Number of pallets

It is estimated that there are 140 million pallets in the Australian market, with annual demand in 2017 of 56 million (Freedonia Group: 2014).

Respondents were asked the typical number of pallets in their control at a given time, generally termed the pallet “float”. The pallet floats held by one third of respondents were greater than 10,000 pallets at a given time, while the remainder of pallet float averages were distributed between companies holding less than 1,000 pallets and those with between 1,001 and 10,000 (see Figure 4).

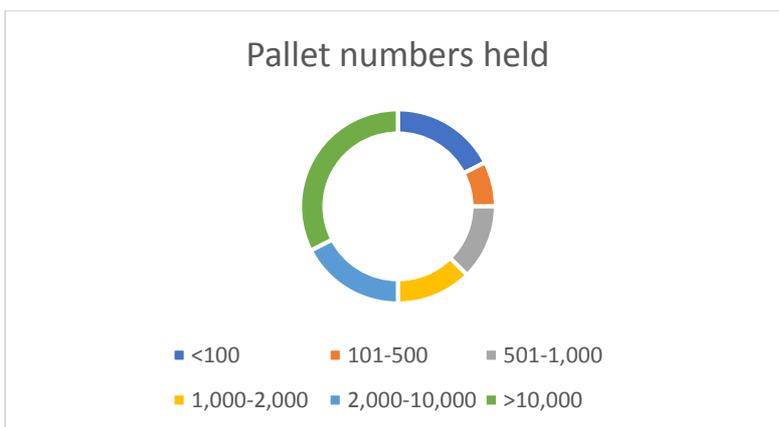


Figure 4: Pallet float numbers held in the business, Pallet Survey 2017, CSCL.

Large pallet holdings under the control of companies at a given time indicates that the pallet is an important piece of equipment in the operational environment of the business.

## 2.5 Pallet materials

The timber pallet dominates as the material used in the previous 12 month period, with 87.5% using timber. 7.5% were using a plastic pallet and another 5% used pallets made from other materials, including metal.

## 2.6 Drivers of pallet usage

Cost is the most common driver in relation to the pallet selected. Daily rental price (51%), purchase price (38%), cost per use (15%) and total cost per year (28%) were selected. Respondents were able to indicate up to eight factors that would influence their choice of pallet.

Beyond cost, the following factors were selected in order:

- Customer requirements
- Strength
- Durability
- Rack-ability
- Ability to re-use the pallet without repair
- Safety
- Availability
- Ability to clean the pallet
- Meeting regulatory requirements
- Contamination
- Weight
- Repair-ability
- Ease of disposal
- Recyclability and life cycle impacts.

## 2.7 Sourcing of pallets

The majority of pallet users source pallets by renting from a pool managed by a third party (66%). 14% of respondents re-use inbound pallets. 8% purchase new pallets, 3% purchase used pallets and another 6% purchase a mix of new and used pallets. 8% either use a mix of these sources, or transport pallets between users themselves, effectively saving on the cost to return the pallet to the rental pool and the re-issue of pallets from the rental pool depot. This is termed “triangulation” and represents a saving to both the parties and the pooling company.

## 2.8 Usage setting

Pallets can be restricted to storing product within one site, such as production facility, or moved between suppliers and production or storage facilities, such as in the case of an ingredient supplier to a manufacturing process, or between a winery and a storage warehouse. This arrangement is termed a “closed loop”. Pallets may also be used in a supply chain “open pool”, where they are handed off from one custodian to another as the product is moved from production to sales and returns with salvage product.

80% of companies mainly use the pallets in their control in an open pool, receiving from and despatching to multiple sites. 17% use pallets as on-site equipment, while 6% use pallets in a “closed loop” system.

## 2.9 Concerns in pallet usage

44% of respondent companies indicated that the cost of pallets in purchase or rental was a concern. However, the largest concern indicated by respondents relates to pallet control, with the management of pallet inventory and the loss of pallets (selected by 66% and 41% of respondents respectively) nominated.

Other concerns, in order of frequency were:

- Safety
- Quality
- Availability when required
- Poor durability/pallet life
- Limited choice of suppliers
- Managing repairs of pallets
- Contamination risks
- Poor customer service from suppliers
- Variation in sizes e.g. EU standard preferred
- Pallet disposal costs
- Theft.

## 2.10 Pallet rental

Asked the benefits in renting pallets, the key benefits identified were the flexibility to increase or decrease pallet numbers as needs vary, and the ability to treat this cost as an operational expense rather than capital on financial ledgers. Other reasons for choosing to rent were the higher quality of pallets available, lower overall costs and avoidance of the asset management functions such as pallet repairs.

The down sides to the rental model were identified as the exposure to ongoing fees for lost pallets (80%), the total cost of pallet operations (48%) and a lack of transparency regarding costs (32%). Other less frequently selected issues associated with rental were the lack of control over pallet audits, theft of pallets, and the limited selection of pallet types.

Asked to rate the performance of their current 3<sup>rd</sup> party pallet pool operator, two thirds of respondents ranked their current pallet pool operator at 5 or above on a Lickert scale, with a score of 5 being “adequate” and a score of 10 being “excellent”.

Asked whether they expected their use of a 3<sup>rd</sup> party rental pool operators would change over the next 2 years, 56% anticipated this would not change, while 37% anticipated an increase in the usage of the pool and 7% anticipated a decrease in usage.

## **2.11 Usage of plastic pallets**

A number of questions were included in the survey related to the usage of plastic pallets. Our research shows a gap in hardwood supply in Australia within the next decade and an interest expressed by companies in the pharmaceutical and food sectors in plastic pallets. In order to explore this further, we surveyed the drivers of interest, benefits, and perceived disadvantages of respondents in relation to plastic pallets.

The benefits identified by respondents in usage of plastic pallets when compared to wooden pallets were avoidance of contamination and absence of nails and splinters. 25% nominated no benefits over timber and 16% did not know, presumably not having used plastic pallets.

Asked what were seen as major disadvantages of plastic pallets, cost was the primary issue, while rack-ability was seen by 36% of responses to be an issue, followed by repair-ability and load capability.

22 % of respondents were likely to increase their use of plastic pallets, while 72% anticipate their usage to remain static over the next 2 years, with 6% likely to decrease usage.

Most respondents did not believe there would be a change in plastic pallet use over the next 2 years, citing customer requirements and regulatory requirements as being the strongest drivers of demand for plastic pallets.

## **2.12 Pallet standards and safety**

The issue of safe working loads on pallets was raised as an issue for Chain of Responsibility. Trucks are allocated pallet spaces, however the load borne by the pallet space in addition to the pallet tare weight can exceed the pallet’s mass and dimension. Many consignors are unaware of the safe working load of the pallet (2000kg – tare weight of a standard pallet is 30-40kg).

An increase in usage of Asian standard pallets (1.2 x 1.2m) and Euro standard pallets (1.0 x 1.2m) for imported product distribution creates issues for warehouse racking in Australia, often designed for the CHEP pallet (1.165 x 1.165m).

## 2.13 Pallet control

Companies responding to the survey drew attention to the high cost in their businesses of pallet control administration.

A number of comments from respondents raised the issue of delivering goods on pallets to customers who have no pallet pool accounts. This effectively means that the last custodian is the transport company. If the pallets go missing, the transport company is liable for the fees and charges for rental and re-issue/replacement of the pallet. A number of transport companies have added a pallet surcharge to manage this liability. Transport companies also report their perception that loss of pallets can often be the result of theft or unauthorised re-use of the pallet.

When transport companies do not exchange all pallets at distribution centre receipt docks, this can result in up to 45 days of rental incurred per pallet, as the forward pallet is stored and unable to be directly retrieved and no replacement pallet has been returned. These costs can accumulate and represent a significant cost to the original company loading the pallet.

Regional companies have expressed an interest in exploring triangulation of containers between regional shippers who share pallet rental accounts with the one supplier, with a view to the cost savings available from transport of pallets and concerns about stockpiles of pallets awaiting repatriation.



# TOPICS RAISED IN CONSULTATION

## 3 Topics raised in consultation

### 3.1 Increasing variety of pallet dimensions

Decline in Australian manufacturing is one of the dynamics driving the influx of European and Asian pallet sizes. Another dynamic is the changing nature of retail, resulting in requirements for in-store display pallets, with half pallets (775mm x 590mm) promoted as an industry standard. However a proliferation of retail pallets have emerged to suit specific retailer floorspace requirements.

Companies involved in storage of a mix of pallet sizes confront the question of racking and prevention of collapse and slippage on racking designed for the CHEP standard pallet. Some have responded that they are placing international pallets on top of domestic pallets for storage. Others are arranging additional beams and strapping to avert risk. Consultations revealed that, as for many “one way” pallets, these international pallets lack the strength for domestic distribution safety.

A number of companies are transferring goods onto a domestic pallet for domestic transport and storage, with the associated cost and time required. This results in wastage as international pallets are discarded and the cost of disposal of these pallets is passed on to end-customers.

### 3.2 Whole-of-supply-chain load unitisation

The growth of import pallets and increased focus on sustainability in supply chains may require greater consideration of pallet selection as being an intrinsic part of the product and its whole-of-supply-chain planning.

*“To significantly improve the operational efficiency of global supply chains, supply-chain owners and operators must integrate the design of pallets, packaging and unit-load handling equipment. Today, these three components of the supply chain are designed by three different design communities that do not interact, meaning that supply chains operate with significant avoidable costs. What is needed is a fundamental shift from the “component-by-component” design process to a true “systems” design process that considers how the pallet, packaging, and shipping, storage and handling systems interact mechanically. The pallet is the key because it is the interface between the other two components. The pallet can be used to significantly reduce supply-chain operating costs, improve supply-chain operating safety, and increase supply-chain operational sustainability.”<sup>1</sup>*

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<sup>1</sup> [http://palletenterprise.com/view\\_article/4548/Markets-in-Transition:-Material-Handling-Trends-as-Pallet-Market-Disruptors](http://palletenterprise.com/view_article/4548/Markets-in-Transition:-Material-Handling-Trends-as-Pallet-Market-Disruptors)

### 3.3 Automation demands conformation

The increase in automation within distribution centre and warehousing environments applies to the premium market segments of fast moving consumer goods (FMCG) and pharmaceuticals for high volume applications. It also applies to the parcel sortation centre environment. There is an expectation that e-tailers such as Amazon are accelerating demand for automation. DHL uses pallet dimensioner technology to ensure weight is managed and loading optimised for customers using palletised loads.<sup>2</sup> In the Arnott's Queensland DC, Linfox is using four palletising robots which rely on high conformation of pallet sizing.<sup>3</sup>

“Because robotic systems do not adjust well to variation in their operating environments, “smarter” pallets are required as supply chains become more automated. Smarter pallets are pallets that are stiffer and do not sag in storage racks; are more uniform in geometry and dimension; and have flat surfaces for better interfacing with packaging and equipment.”<sup>1</sup>



According to Logistics Bureau, “Automation has also become significantly more popular. Products, cartons and pallets can be moved automatically by conveyor or forklift, according to instructions given by the automating IT system. Two situations in particular motivate enterprises to invest in automation. One is the need to use the footprint of a warehouse as efficiently as possible by extending warehousing vertically: automated systems can work to heights of as much as 40 metres. The other is in environments that are more difficult for human beings to work in, such as refrigerated warehouses for fresh products and certain pharmaceuticals.”<sup>4</sup>

In the US, forecast investment in automated storage and retrieval systems is expected to grow at 7.2% annually through to 2020.<sup>5</sup>

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<sup>2</sup>[http://www.mt.com/au/en/home/products/Transport\\_and\\_Logistics\\_Solutions/Cargoscan\\_pallet\\_dimensioning/dimensioning\\_weighing\\_scanning/CSN840\\_dimensioner.html](http://www.mt.com/au/en/home/products/Transport_and_Logistics_Solutions/Cargoscan_pallet_dimensioning/dimensioning_weighing_scanning/CSN840_dimensioner.html)

<sup>3</sup> Dexion, Linfox Arnott's Case Study, [www.dexion.com.au/case-study/linfox-arnotts/](http://www.dexion.com.au/case-study/linfox-arnotts/)

<sup>4</sup> Logistics Bureau, Warehousing, the Rise of IT and the Sort-of-Rise of Automation, Jul 6, 2015

<sup>5</sup> [http://palletenterprise.com/view\\_article/4548/Markets-in-Transition:-Material-Handling-Trends-as-Pallet-Market-Disruptors](http://palletenterprise.com/view_article/4548/Markets-in-Transition:-Material-Handling-Trends-as-Pallet-Market-Disruptors)

### 3.4 Safety

The following tables demonstrate the number and nature of claims for injury (including musculoskeletal disorders) in the *Transport, postal and warehousing* industry division, due to *Forklift and pallet trucks* and *Pallets* – for claims lodged by financial year between 2000-01 and 2014-15:

Financial year	Forklifts and pallet trucks	Pallets
2000-01	822	847
2001-02	839	849
2002-03	857	741
2003-04	864	766
2004-05	888	774
2005-06	807	710
2006-07	827	736
2007-08	742	659
2008-09	695	623
2009-10	635	571
2010-11	562	548
2011-12	623	581
2012-13	609	507
2013-14	524	496
2014-15	395	410

Nature of injury		Forklifts and pallet trucks	Pallets
Traumatic	Trauma to muscles and tendons	21%	23%
Joint/Ligament And Muscle/Tendon Injury	Residual soft tissue disorders due to trauma or unknown mechanisms Trauma to joints and ligaments	18%	17%
Wounds, Lacerations, Amputations And Internal Organ Damage		24%	25%
Musculoskeletal And Connective Tissue Diseases	Diseases Of The Muscle, Tendon And Related Tissue	5%	5%
	Spinal Vertebrae And Intervertebral Disc Diseases - Dorsopathies	4%	5%
	Other Soft Tissue Diseases	1%	1%
	Joint Diseases (Arthropathies) And Other Articular Cartilage Diseases	1%	1%
Fractures		8%	6%
Other Injuries		2%	1%

Source: Safe Work Australia, 2016

Injuries sustained from pallets are declining as a source of claims reported. However, they still exceed the number of injuries from forklifts and pallet trucks/AGVs as a source of risk in the industry.

### 3.5 Use of RFID tracking of pallets

Using RFID to track pallets has not been widely applied in Australia. Toll now offers this service to its customers.<sup>6</sup> The frustration and cost of lost pallets is a major issue for users of the pallet pooling services. These companies have incorporated recompense for lost assets in their business model, however they point to the opportunity costs associated with lost and missing pallets. Charges accrue on daily rental of missing pallets and this is followed by a write-off fee in a pallet audit.

A number of transport companies reported they now include a pallet purchase fee in their invoicing, particularly for delivery to end customers who have no account with the pallet pooling companies. This action has been in response to high lost pallet costs and the inability of the transport companies to retrieve the pallets from the site in a timely manner, if at all. The result is to increase transport costs in a supply chain and to add surplus pallets to wastage at the end customer (however we note a surprising number of end customers re-using these surplus pallets themselves).

Norwegian pallet leasing company Norsk Lastbærer Pool is piloting RFID tags for tracking plastic pallets in two food factories and distribution centres. The company manages pallet leasing for retailers and manufacturers in the grocery industry, handling yearly over 5.5 million pallet trips. Norwegian FMCG companies have already used approximately 150,000 tagged plastic pallets leased by NLP which the companies have not been able to track in real time resulting in lost pallet stocks. The participating companies were able to track their products from site to retailers without a need to invest in the reader infrastructure, since the costs for the reading system are included in NLP's pallet leasing fees. NLP is aiming at standardising their RFID infrastructure package to be applied for any national facility in the consumer goods supply chain. The company is also planning to utilise RFID technology at its own washing and repair stations where repair data of each pallet will be recorded by handheld readers and stored as the pallets are passing through RFID portals.<sup>7</sup>

### 3.6 Cost of pallets

The lifespan of the timber pallet in Australian supply chains is a maximum of 7 years with a repair cycle of between 20 and 30 trips. This means the supply of hardwoods for repair and replacement is a key input to the pooled pallet system. Supply of hardwood timber offcuts is expected to be impacted by a general shortage of hardwood supply in Australia from 2025, as harvesting of native forests transitions to plantations.

Companies consulted raised concern at future cost of pallets, anticipating a cost increase as a result of a gap in supply of hardwood native forest products due to the closure of sawmills and lack of investment in managed investment schemes in plantation hardwood (FWPA:2016).

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<sup>6</sup> <http://www.tollgroup.com/case-study/item-level-freight-tracking-for-pallets>

<sup>7</sup> <https://www.smartrac-group.com/rfid-enables-real-time-tracking-of-pallets.html>



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