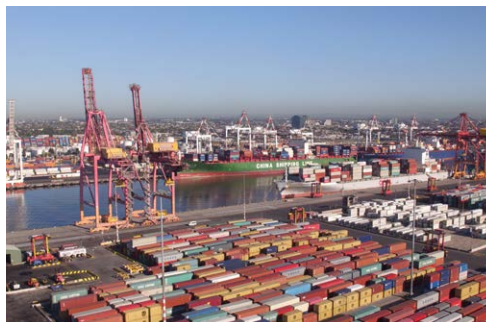


# FREIGHT LOGISTICS: INFRASTRUCTURE INVESTMENT THESIS

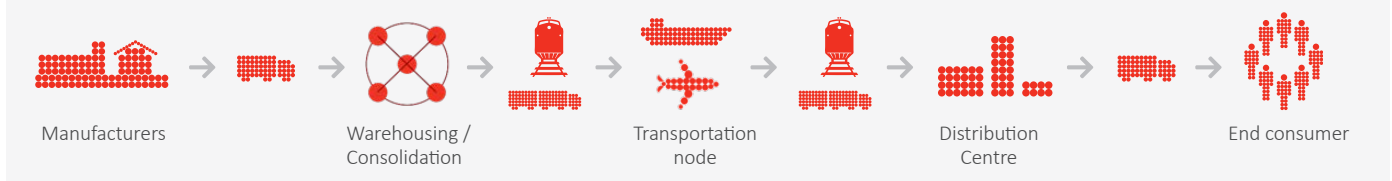


# 1 INTRODUCTION

Roads, railways and ports are traditional transportation infrastructure assets which form the backbone of supply chains that handle the freight tasks of nations, fuelling local and global economic activity.

With the global freight task expected to triple over the next 30 years<sup>1</sup>, freight-linked assets can represent highly attractive investment opportunities.

Figure 1: Simplified freight logistics supply chain



In addition, evolving demographic and consumer trends, coupled with technological innovations are creating opportunities for infrastructure investors in additional subsectors within the global supply chain, especially in freight logistics.

We have defined freight logistics as the process and management of transporting goods, cargo and commodities from the point of origin to the point of consumption.

This paper will briefly examine some key trends expected to drive growth in this sector before giving a high-level overview of the freight logistics spectrum, highlighting the inherent

infrastructure characteristics of target subsectors and analysing the opportunities that are arising with End-to-End (E2E) Service Providers and Warehousing.

At the outset it is important to recognise that freight supply chains are typically very heterogeneous, dependent on various local and market-driven factors. This necessitates an active approach to deconstructing value chains and market dynamics when assessing specific investment opportunities. In an increasingly competitive market, this active approach assists in identifying opportunities which deliver attractive relative value as well as positive portfolio diversification.

# 2 KEY TRENDS DRIVING FREIGHT LOGISTICS

Transportation assets, which are key nodes, are typically highly sought after by investors given the exposure they provide to long term, macroeconomic growth. This linkage is particularly stark for freight-related assets given the virtuous cycle associated with economic activity leading to an increasing freight task which in turn drives further economic activity.

Overlaying the impact of changes to consumer trends and increasing urbanisation, combined with technological innovation, the demand outlook for freight logistics over the longer term appears attractive.

Figure 1: Freight logistics driving economic activity<sup>2</sup>



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## 2.1 DEMOGRAPHIC AND CONSUMER TRENDS

The following trends are expected to drive robust growth in freight logistics demand, with the impact of each individual trend further compounding with the others:

**1. Population growth:** Freight logistics is needed to facilitate the delivery of goods required for basic living and consumption. An increase in the consumer base results in a natural increase in the amount of goods required, and consequently the demand for effective and efficient freight transport and logistics. For example, Australia's population has been forecast to grow by almost 75% over the next three decades, pushing up the nation's aggregate demand for goods.<sup>3</sup> The World Economic Forum has also forecast global population will reach nine billion by 2050, growing at 23% from predicted 2020 figures.<sup>4</sup> The number of people living in urban areas is also projected to increase by 2.3 million over the next 30 years.<sup>5</sup>

**2. Income growth:** As disposable household income increases, so does consumer demand for goods. Over the long-run, aggregate income grows in line with growth in productivity and technological advancement, facilitating greater consumption and demand for goods. In Australia, personal income increased by 120% between 1994-2018, with a CAGR of 3.3%.<sup>6</sup> In China, urban disposable income per capita increased by a CAGR of 9.1%<sup>7</sup> over the same period, due to higher productivity growth which is typical of developing economies. Notwithstanding recent softness in global wage growth, the positive income growth trend is expected to continue over the longer term.

**3. E-Commerce:** The rise of online shopping has resulted in more intensive transport demands, disrupting parts of the traditional retail sector and supply chains. The estimated Compounded Annual Growth Rate (CAGR) for global E-commerce over the next three years is 21% with a penetration rate of the global retail of almost 15% by next year.<sup>8</sup> It is also projected that, against this backdrop, total freight volume will triple by 2050.<sup>9</sup> Australia's online shopping penetration currently represents 10% of total retail spend, with 73% of household purchases occurring via an online platform.<sup>10</sup> In the US, e-commerce represents 11% of total retail spend.<sup>11</sup> Globally, online retail sales have experienced 10-15% year-on-year growth in recent years, with the trend expected to continue as penetration increase.<sup>12</sup>

**4. Urbanisation:** The increased urbanisation of cities results in a need for more efficient investment in logistics supply networks. The United Nations estimates that another 2.5 billion people will be added to urban areas by 2050.<sup>13</sup> In Australia, capital cities are home to over two-thirds of the population, with 70% of annual population growth concentrated in Sydney, Melbourne and Brisbane.<sup>14</sup> Existing key nodes such as airports, ports, other nodal facilities will need to embrace technology to meet the demand and requirements for better utilisation.

As consumption growth leads to expanded – and more localised – freight logistics networks, increased convenience has the potential to unlock latent demand which can further drive growth in the freight task.

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## 2.2 TECHNOLOGICAL INNOVATION IN FREIGHT LOGISTICS

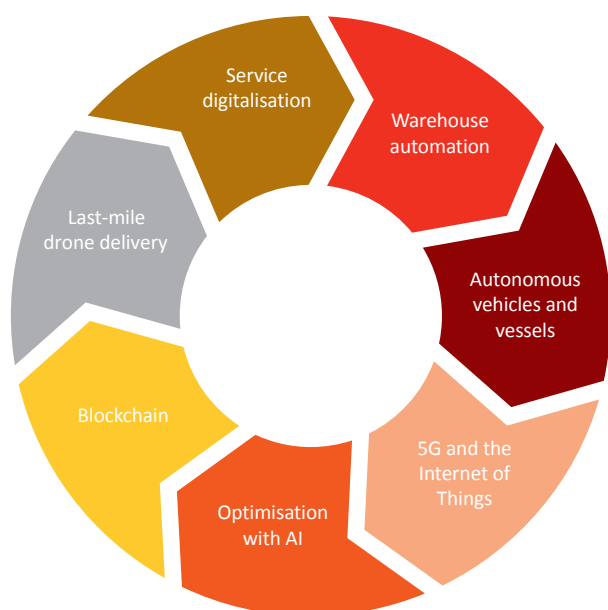
In addition to macroeconomic trends, a number of key technological advances are expected to create significant tailwinds for freight logistics. To illustrate this dynamic, we highlight two technology examples below which are expected to substantially improve efficiency and improve customer experience in the sector. These trends should result in reduced costs and the generation of additional demand:

**1. Warehouse automation:** Amazon and JD.com are global leaders in the automation of warehouses. They have illustrated how built-in computer functions and algorithms in automated warehouses have increased efficiencies (including for manual processes), decreased the need for more space and become more accurate in terms of matching orders with delivery targets. Please refer to our case study on JD.com in Section 6.2 for further details.

**2. Autonomous vehicles and vessels:** In the United States, 65% of consumable goods are currently transported by truck. If vehicles are fully automated, it has been estimated operating costs would drop 45% leading to savings of between US\$85-125 billion.<sup>15</sup> Leveraging 5G technology and the Internet of Things, it is predicted a fully interlinked and automated warehouse and transport system would enable assets to be used 24/7 and greatly improve efficiency.

Other technological advances expected to have a more medium-term impact include artificial intelligence optimisation, blockchain, drone-enabled last mile delivery and logistics service digitalisation with potential for integration with E-Commerce platforms.

Figure 2: Summary of technological disruptions impacting freight logistics<sup>16</sup>



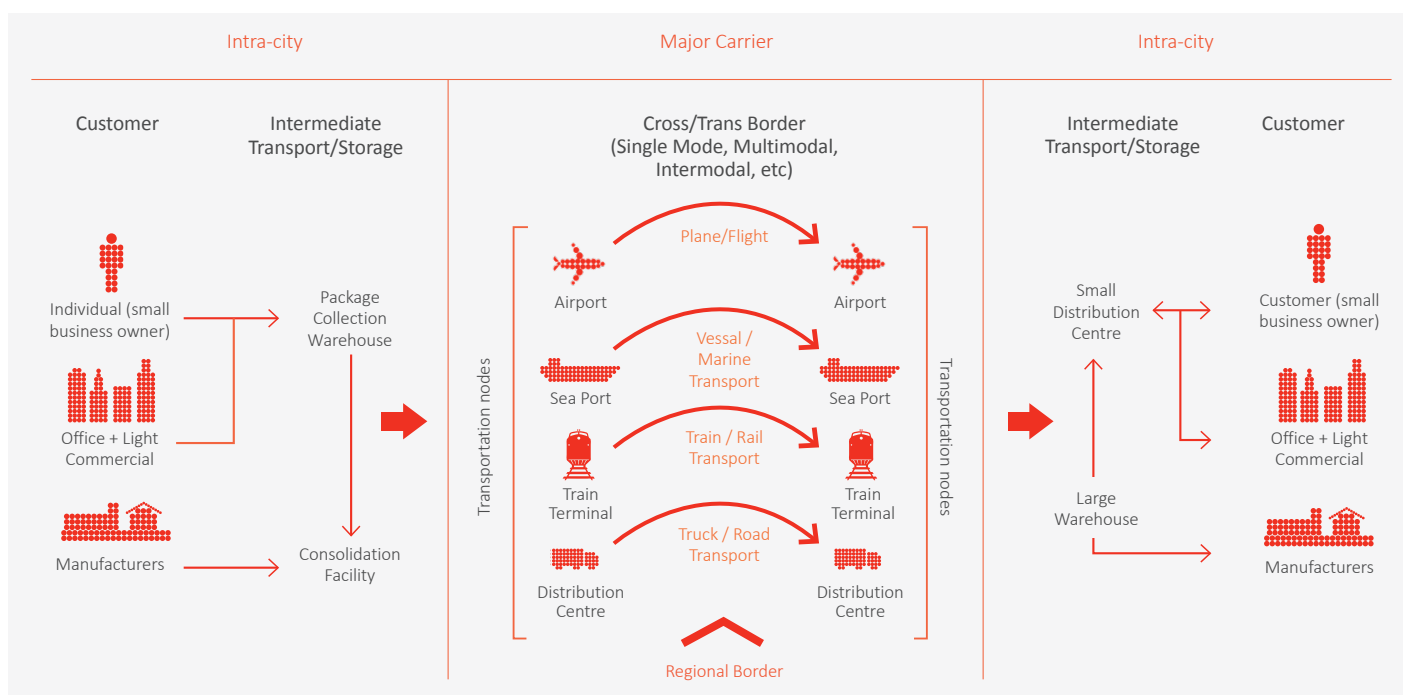
Each of these developments have the potential to drive additional efficiencies, unlock latent demand and promote further growth in the sector. The confluence of macroeconomic factors and technological advances affecting freight logistics are expected to drive significant growth in the sector over the long term. Whilst this provides a positive backdrop for investment in the sector, not all components display the requisite investment characteristics to make them attractive for infrastructure investors. That is - predictable and stable cash flows supported by defensive characteristics with barriers to entry and protection against inflation. A more detailed assessment of the sector is therefore required. QIC's summary views are set out in the following sections.

### 3 DECONSTRUCTING THE FREIGHT LOGISTICS SECTOR

The freight logistics industry is highly complex and geographically dependent; even within the same subsector, certain regional or regulatory eccentricities can materially alter the risk profile of a business. The simplified diagram

below outlines in general terms three major segments that makes up the end-to-end freight logistics supply chain: intra-city (from a customer/manufacturer origination) through to major carrier and finally, end-point intra-city.

Figure 3: Overview of Freight Logistics Sector<sup>17</sup>



**Point of origin – Intra-city:** In this first segment, freight is moved from the supplier to warehouses for consolidation with other goods, before being transported (typically via truck) to major cross-border/trans-border transit nodes. Here, a freight forwarder is the major player that integrates freight information and manages the forwarding processes.

**Major carrier:** A major-carrier conducts cross-border/trans-border services between major transit nodes, through four modes of freight services: road, rail, sea and air. A third party logistics (3PL) company may manage the whole logistics process, integrating information from various service providers and formulating the best option for the customer.

**End point – Intra-city:** Close to the destination, freight is unloaded before it is assigned a delivery for customer requests where delivery is made by a truck operator or a customer picks-up their goods. Online retail sellers where goods are listed as inventory are stored in warehouses before delivery. For consolidated freight deliveries, warehouses serve as distribution centres before the intra-city delivery process.

While many freight logistics businesses operate within discrete legs of the freight logistics supply chain, certain markets can support the existence of End-to-End (E2E) service providers. An analysis of E2E service providers can be found in Section 6. They are the first and only point of contact, removing the need for freight forwarders. Unlike 3PLs, the E2E provider will use in-house transport assets and last-mile delivery.

## 4 INVESTMENT PERSPECTIVES ON KEY SUBSECTORS

Infrastructure investors typically have a deep understanding and affinity for key “nodal” or “gateway” assets within the freight logistics supply chain, such as ports and airports. Such assets tend to enjoy highly defensive characteristics often with few directly competing alternatives and by their very nature tend to be lower risk.

One such example of a key nodal asset is the Port of Melbourne. It serves as the gateway for freight entering and exiting the State of Victoria with a trade catchment also extending into Tasmania, south-western New South Wales and eastern South Australia.

### CASE STUDY: PORT OF MELBOURNE

- QIC, together with its partners in the Lonsdale Consortium, completed what was then the largest transport infrastructure M&A transaction and acquisition debt financing in Australian history when it successfully acquired a 50-year lease of the Port of Melbourne in September 2016.
- As Australia’s largest container and general cargo port, the asset handles approximately 37% of Australia’s container trade. In FY2019 approximately 3.0 million twenty-foot equivalent units and 406,000 motor vehicles were handled through the port.
- Port of Melbourne has a footprint of approximately 505ha of port land, 100,000ha of port waters, 35 berths and services 72 tenants and 42 shipping lines.
- As a landlord port, its business model is characterised by control of port land and essential port civil infrastructure such as wharves and shipping channels. It also oversees management of general utility connections, roads, bridges and some rail infrastructure in the port precinct.
- The Port has a long-term vision to support Victoria’s freight demand and support the efficient movement of goods within Melbourne and regional Victoria, including establishing a workable metro rail-freight solution.

Source: Port of Melbourne





Beyond these core infrastructure assets, adjacent subsectors along the freight logistics supply chain have been shown to demonstrate key infrastructure characteristics in certain circumstances.

Given the heterogenous nature of supply chains noted earlier, a disciplined approach needs to be taken in assessing the infrastructure characteristics of subsectors and individual

assets on a case-by-case basis. This is best undertaken, where possible, using objective criteria that is well-defined and measurable. We note this exercise should also be undertaken in assessing those businesses classified as “core” infrastructure, given the potentially disruptive impacts of certain macroeconomic trends and technological innovations which are increasingly emerging.

## 5 KEY INFRASTRUCTURE CRITERIA

QIC applies a disciplined checklist approach when assessing the infrastructure characteristics of a business. Key criteria include:

### Essential service

- Businesses related to the provision of essential goods such as basic living needs generally have highly predictable throughput volumes
- Inelastic customer base with “stickiness” to a single service provider

### Predictable cashflow

- Underlying demand drivers linked to macroeconomic factors with stable outlook (e.g. population growth)
- Revenue may be underpinned by contracts or strong customer relationships
- A diversified customer base spread across various industries will prevent exposure arising from shocks in a single market

### Barriers to entry

- High barriers to entry which can include regulatory protections and/or natural competitive advantages such as significant capital outlays, network efficiencies or switching costs from incumbents
- Vertical integration may create additional efficiencies and increase barriers to entry

### Stable regulatory / pricing regime

- Operate under a highly stable, regulated market or regime which is transparent with decision review mechanisms
- Pricing protected by regulation or contractually linked to observable indices

By taking a disciplined approach to the assessment of these criteria, we have been able to objectively identify opportunities within the freight logistics supply chain that can meet the objectives of our infrastructure mandates and provide attractive risk-adjusted returns.



## 6 FREIGHT LOGISTICS SUBSECTOR OPPORTUNITIES

In addition to the well-established transport infrastructure subsectors of roads, railways and ports, a number of subsectors within the freight logistics supply chain have the potential to exhibit a strong fit with our infrastructure investment criteria. However, a case-by-case assessment is always required in our view.

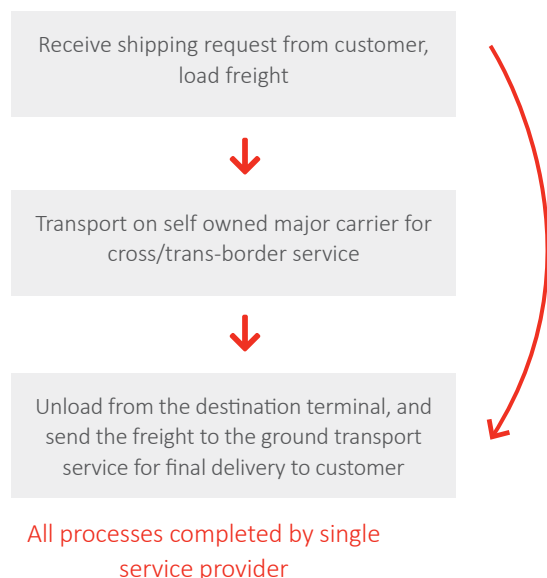
Two examples of subsectors displaying such traits are End-to-End (E2E) Service Providers and integrated nodal warehousing.

### 6.1 E2E SERVICE PROVIDERS

E2E Service Providers' own all channels and assets within their respective supply chains and have integrated processes and touchpoints between the shipper and the customer. This type of business model enables the owner to manage the system efficiently under a single operational framework, allowing significant synergies by removing interfaces, duplication in risk pricing and more effective information sharing.

Within this closed system, there is no need for customers to outsource part of the freight logistics service to other parties, a process which incurs additional costs.

Figure 4: Overview of E2E chain <sup>18</sup>



The vertical integration inherent in E2E can ensure investment opportunities are highly predictable, especially if they have significant market share in a specific regional market and further when they supply essential goods. Higher market share can lead to earnings predictability for E2E Service Providers because the integrated systems can benefit materially from economies of scale, in addition to the economies of scope inherent with integration. As the volume these businesses

service increases, marginal cost tends to decrease, increasing their competitiveness and potentially serving as a barrier against new entrants.

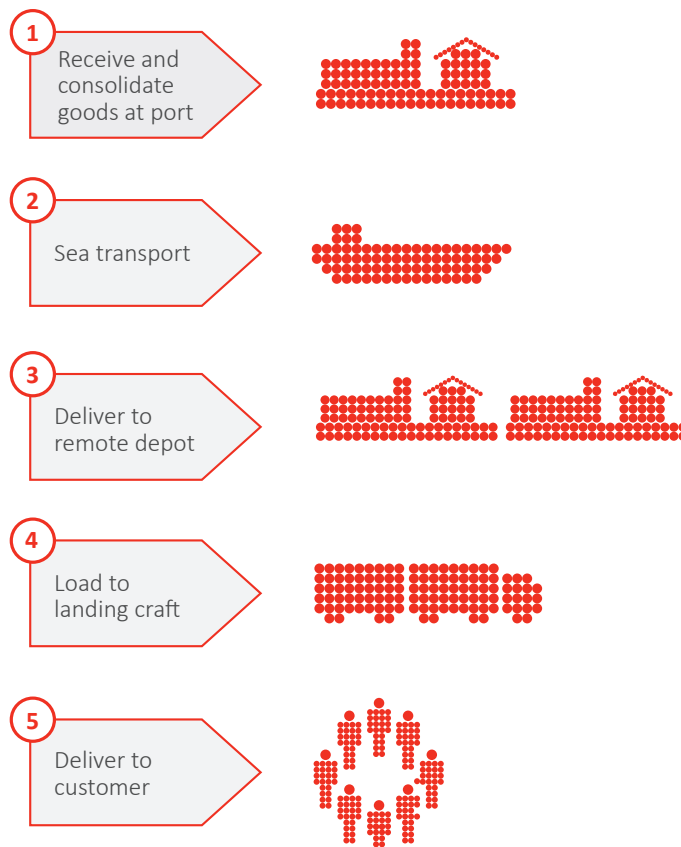
Whilst the fundamentals of E2E Service Providers are positive, the universe of specific investment opportunities displaying appropriate infrastructure characteristics is often limited. Certain E2E Service Providers may handle essential cargo but operate in a competitive environment or conversely may be highly specialised (or even monopolistic) with the trade-off that the underlying cargo volumes handled are more volatile or cyclical.

The following case study on Sea Swift serves to highlight an example of one business within this subsector offering strong infrastructure characteristics, which provided the impetus for QIC to pursue it as an opportunity for its Global Infrastructure Fund on behalf of our clients.

#### 6.1.1 CASE STUDY: SEA SWIFT

Sea Swift is an E2E integrated marine transport and logistic services provider operating across Northern Australia, delivering essential goods to remote Australian communities via its fleet of 27 vessels, 200+ frontline equipment and eight depots (see figure 6 for asset locations).

Figure 5: Sea Swift's value chain



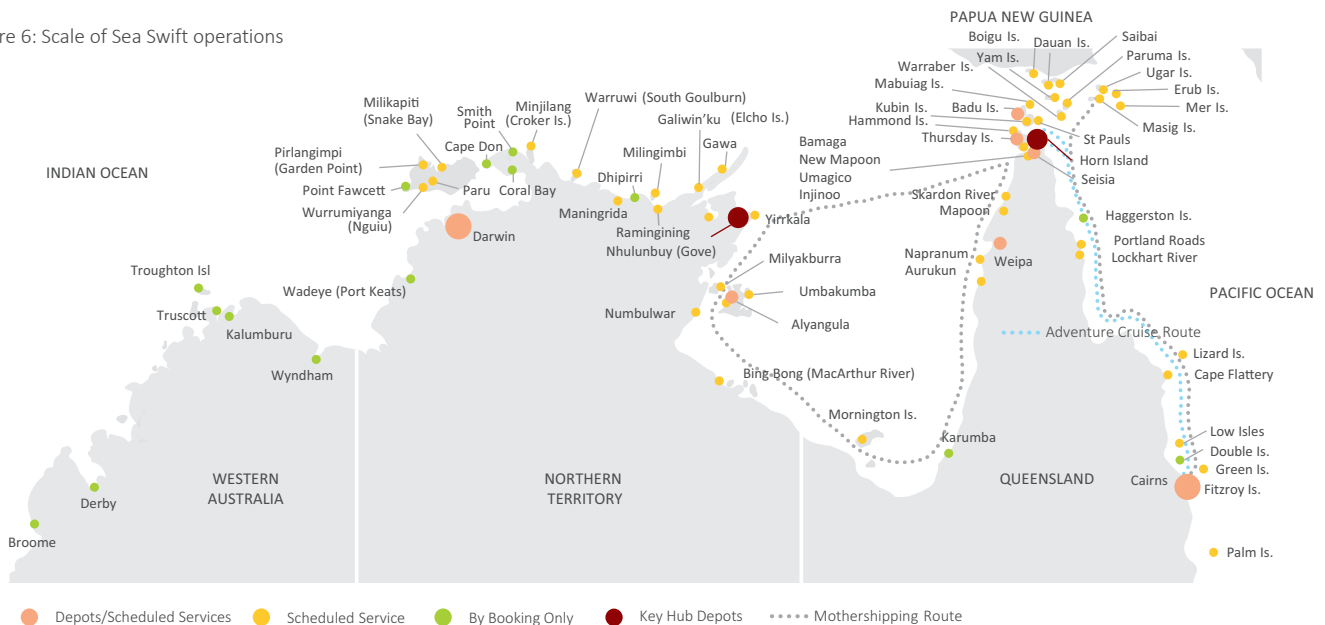
Sea Swift provides the following:

- Delivery of living necessities such as food, fuel, household/ medical/educational supplies as well as commercial materials;
- Services to over 50 locations across Northern Territory and North Queensland with only 5% of the locations having reliable, year-round road access;
- Services to a diversified customer base – from resource companies to supermarket chains and local governments;
- Strong customer focus; and
- Adoption of a network operating model with regards to vessels and depots, allowing for more reliable, frequent services at lower marginal costs.

Sea Swift is the only operator providing both general cargo and charter freight services to remote communities in Far North Queensland (FNQ) and the Northern Territory (NT). It is the pre-eminent provider of scheduled general cargo freight services in the region. The business has attractive Environmental, Social and Governance (ESG) fundamentals, particularly in respect to its social dimension given the vital connections it provides for remote coastal and island communities which have few reliable alternatives for transporting freight and essential goods and through its direct and indirect support of indigenous communities.

Sea Swift provides a unique opportunity to invest in an integrated freight and logistics business with strong, defensive infrastructure characteristics along with significant growth potential linked to various Northern Australia initiatives.

Figure 6: Scale of Sea Swift operations



Source: Sea Swift (as of September 2019)

## 6.2 INTEGRATED NODAL WAREHOUSING

Warehouses have traditionally been considered real estate investments, given their low barriers to entry and strong levels of competition. They also have unregulated pricing structures, culminating in a lack of cashflow predictability.

As the freight task increases, the upfront capital cost of warehouses is growing well beyond the physical structure, and the warehouse forms an integral component for hub and spoke distribution models – making warehouses increasingly attractive to certain infrastructure investors. In the past, warehouses were fragmented, smaller in size, less technologically advanced and separately owned by different

companies. However, growing populations with increased consumer spend are driving the development of larger and in some cases, automated, warehouses.<sup>19</sup>

The scale, connectivity and at times advanced technological requirements of these warehouses require significantly higher initial capital outlays and as such, investments are often underpinned by longer term contracts with key customers. Further, given the level of automation, such businesses often have low marginal costs, meaning with increased scale, lower pricing is able to be offered to customers. The case studies below further illustrate the developments in this subsector.



## CASE STUDY: JD.COM

Retail warehouses traditionally need significant manual processing, typically one person is required for every 1,000 square feet – due to the sheer number of orders being fulfilled. However, JD.com, a Chinese e-Commerce company and online retailer, announced in 2018 that it has completed a fully automated, 400,000 square feet warehouse that handles up to 200,000 orders a day.

The facility utilises a complex network of automated machinery including fast-moving conveyor belts, image scanners, driverless forklifts, all overlayed with the company's smart logistics system. Only four people work on-site, whose roles relate to the servicing of robotics that operate the facility. Facilities of similar size require 400-500 human workers.

The fulfillment centre is part of JD.com's supply chain which provides same-day delivery across China, including remote areas.<sup>20</sup>

Source: JD.com



1 Robotic arm and pick sort the package



2 Robotic arm makes a pause to let the camera recognize the label



3 Automated product packaging processes



4 Packages sorted with algorithm are sent into a single box, moved by the belt and sent to the shelf



5 Automated final in-facility delivery for package storage or dispatch

In addition, warehouses located at strategic transport nodes within an integrated logistics network become key hubs for freight activity. Analogous to intermodal terminals, this serves to further enhance the competitive position of these businesses. To achieve this, these warehouses require reliable connections to major modes of transport, such as rail, road or air.

One such example relates to Brussels Airport (which QIC has reached contractual close to acquire a strategic stake in by Q4 2019) and its focus on growing its freight logistics footprint through the implementation of its master planning initiatives.



## CASE STUDY: BRUSSELS AIRPORT CARGO INITIATIVE



- In March 2019, a consortium comprising of QIC, APG and SwissLife was announced as the successful bidder for a 36% interest in Brussels Airport.
- Brussels Airport is a sizeable freehold perpetual airport located in the political capital of Europe, encompassing c.1,245ha of land (same size as London Heathrow). Its dual-till regulatory regime provides the opportunity to benefit from non-aeronautical yield increases through active asset management. With its significant landbank, land rent is a potential source of non-aeronautical revenue growth via the development of logistics or other commercial facilities.
- With its strategic location in the middle of one of Europe's strongest pharmaceutical industry clusters, Brussels airport planned for a 100 million EUR investment in logistics to meet the demand arising from freight movements, especially in the cold-chain logistics services that support the pharmaceutical industries. They targeted buildings larger than 50,000m<sup>2</sup> to serve the shipping, packaging and temporary storing of cargo. Following the launch of this plan, the logistics warehouse take-up rate increased significantly.
- As the first and largest airport community in the world where stakeholders are CEIV<sup>21</sup> Pharma-certified, Brussels Airport stands out internationally for its dedicated infrastructure for the transport and handling of products that require an unbroken cold chain, in particular pharmaceutical and biotech products.
- Brussels Airport has taken the lead in an innovative project to organise temperature-controlled transport on tarmac, with live data and transparent info on location and temperature. The Airside Pharma Transporter aims at closing all risks in the cold chain and offer more transparency and increased confidence to the pharma industry.

Source: Brussels Airport



The future opportunities in this subsector will grow with further integration of automated processes, such as autonomous trucking, which create greater efficiencies across the freight logistics spectrum.

## 7 CONCLUSION

Technological disruptions are evolving and continuing to drive strong demand for the movement of goods and commodities in increasingly urbanised environments, creating strong tailwinds in the freight logistics sector. While infrastructure investors have in the past been focused on a very narrow set of assets within the broad logistics chain, there are businesses that exhibit strong infrastructure characteristics across the supply chain. We believe assets need to be reviewed on a

case-by-case basis, using a disciplined and objective criterion, as regional or specific regulatory nuances may materially alter these characteristics for businesses within even the same subsector. By taking a disciplined approach to investment origination, combined with a proactive approach to portfolio construction, infrastructure investors can diversify into freight logistics opportunities with strong infrastructure characteristics, offering attractive risk-return profiles.

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