

Logistics sector
analysis 2014:
Northamptonshire
Enterprise
Partnership:
Research Discussion
Document

2014



Northamptonshire Enterprise Partnership
Research Discussion Document

September 2014

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Executive Summary

The logistics industry forms a key component of the Northamptonshire economy, with approximately 9% of the workforce employed in logistics and allied fields.

Logistics companies face many challenges in their day-to-day operations, notably cost pressures and a general shortage of skilled labour. In the medium-term, they are also affected by national and international trends, such as the increased use of alternative fuels and the drive towards a circular economy.

Logistics companies prefer to site their operations close to their customers. It therefore follows that if their customers move, or if the geography of their supply chain alters, they will themselves consider moving their location.

HM Government has recently announced a £100m initiative to encourage companies to return their manufacturing operations to the UK from overseas. Northamptonshire therefore has an opportunity to use its excellent logistics location as a factor in persuading companies to set up in the county.

Northamptonshire faces increased competition from other Midlands locations and from new facilities within the UK's port infrastructure, notably London Gateway. Such port-centric solutions promise closer proximity to the dominant London market, but have yet to seriously establish themselves as clearly superior to the classic "big shed in the Midlands".

However, recent investments in warehouse infrastructure have tended to be either North of the county (Lutterworth, Atherstone) or South (Milton Keynes, Enfield, Thurrock). There is therefore a concern that Northamptonshire may be "bracketed" by larger facilities with access to greater pools of labour.

Excellence in Logistics requires excellent Infrastructure. The dominance of road freight continues to demand investment in roads whilst the recent announcement of the investment of £1bn in Daventry's international rail freight terminal will boost logistics employment in the North of the county.

We believe that post-consumer logistics activity such as resource recovery, recycling and remanufacturing has great potential to drive logistics growth. The central location of the county is also ideal for reverse logistics activities and the management of excess inventory.

Businesses in Northamptonshire and across the region are facing long-term difficulties in recruiting sufficient high-quality staff. Many have found solutions through recruiting abroad, typically in Eastern Europe, and a sizeable migrant labour force has settled in the region. In the near term, any easing of the demand for labour might be expected to trigger the return of many of these workers to their home countries, but as time goes by, the integration of this labour force into the local community will progress to the point that many will consider the UK, and Northamptonshire in particular, as home.

Such a pool of talent has the potential to provide a new pool of logistically-aware entrepreneurs who could be at the forefront of the development of new logistics solutions, especially those aimed at facilitating resource recovery and the circular economy.

The logistics industry shares all of the key strategic priorities that Northamptonshire has identified in its Strategic Economic Plan. Without Innovation in its processes, a Skilled and well-educated workforce, Infrastructure, and Housing for its labour, the industry will lose its competitive advantage.

We continue to believe that logistics will play a major role in the Northamptonshire economy. The best way that NEP can support local logistics companies in overcoming their day-to-day challenges is to show leadership in identifying solutions to the skills shortage in Northamptonshire and to identify further improvements to infrastructure that can improve transport reliability in the medium-term.

We believe that it will do so by succeeding in four key endeavours:

- The promotion of Northamptonshire as a preferred location for manufacturing and logistics
- Accelerating the pace of investment in local infrastructure by increasing engagement with public and private funding sources
- The encouragement of entrepreneurship and social enterprise within the county
- The establishment of Northamptonshire as a growth hub for businesses involved in the transformation of the UK towards a circular economy.

We recommend that NEP should provide the leadership for the implementation of an initiative, based on the Deltalinqs model that operates so successfully in Rotterdam, which seeks to focus the industry on its medium to long-term priorities, beginning with infrastructure and recruitment, thereby advancing the competitive position of the regional logistics sector.

We believe that managing the diversity of stakeholders will require the appointment of an individual with significant senior-level experience in the logistics industry to lead the implementation of the initiative.

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2nd September 2014



Setting Priorities for Northamptonshire

The logistics industry forms a key component of the Northamptonshire economy, with approximately 9% of the workforce employed in logistics and allied fields. In some locations, such as Corby and Daventry, this figure may rise to as many as one in eight of all jobs in some wards.

The importance of the logistics industry is recognised in the Northamptonshire Strategic Economic Plan, which targets economic growth and job creation within the county. Logistics is one of four key sectors for NEP, alongside Food and Drink, the Creative and Cultural Industries, and High-Performance Engineering.

The trends currently active in the logistics sector have the potential to significantly change the attractiveness of the county as a place to site logistics operations, and to change the nature of those operations themselves. Some of the potential changes will have a negative impact on established businesses, whilst others have the potential to reinvigorate the industry, securing its contribution to the regional economy for decades to come. Many of the trends will show effects in the near term (some are active now), whilst others will take longer to act.

The challenge for the Northamptonshire Enterprise Partnership and for the County Council is to understand the role that they can play in ensuring a positive outcome for the county, and their influences and strategies necessary to achieve the desired end state.

We have taken a two-stage approach to identifying the key trends that are active in shaping the international, national and local logistics industry. Firstly, we have conducted a review of published sources to identify those issues that have been, and will be, of interest to Northamptonshire. Secondly, we undertook a focused survey of opinions from the local, national and international logistics industry, basing our questions on the results of the secondary study.

This discussion draft presents the findings of our research, from both secondary and primary sources.

The report authors welcome any comments on the material presented in this report, and would especially welcome any data that would add to our understanding of the state of logistics, whether internationally, nationally or locally.

Identifying the Key Issues in Logistics

Logistics is an industry that possesses a dual character. As an industry, logistics is dependent on long-term investment, yet the day-to-day operations of logistics companies can seem very short-term indeed, often placing management under significant pressure to perform.

In seeking to identify the key issues in logistics, we recognise that we needed to overcome the natural tendency of individual companies to put forward the issues that are most pertinent to their short-term problems, rather than offer insights into their longer-term plans.

Our approach has therefore been to use bibliometric methods – mathematical and statistical analysis of published material – as an initial tool to identify those issues that have received the most attention in the past three years. We distinguish between academic sources – which represent issues that have been supported by research grants and are therefore deemed important by funding institutions – and the broader press. The broader press, including the trade press, has a tendency to publish material that its readership considers important, an important distinction from the more fundamental scientific principles of the peer-reviewed academic literature.

Indeed, some issues of great strategic importance may not even be considered by some editors, whose focus on the interests of a narrow readership is based on sound commercial principles. In such cases, we will have to apply our own judgement as experts in the field to determine whether an issue that has received a high degree of attention is, in fact, material to the development of a medium-term strategy.

We have therefore conducted separate bibliometric analyses of the peer-reviewed (academic) and non-peer-reviewed literature in order to develop a balanced view of industry opinion and to guide the design of the survey of logistics companies in Northamptonshire.

The results of these analyses are reported in the following section. In our final report, scheduled to be published in July, we will use the responses to a broad survey of logistics professionals to complete the identification of the short-term pressures facing the industry, thereby completing the picture from long to short term.

Bibliometric analysis of the peer-reviewed literature

ZETOC is an online research database, providing access to over 29,000 journals through the British Library's electronic table of contents.

Both peer-reviewed and non-peer reviewed journals are covered by ZETOC.

A two-stage bibliometric analysis was conducted. Firstly, an initial sample of 600 peer-reviewed records dating from 2013 that contained the keyword "logistics" was inspected to determine the subject of the article. The subjects were classified into broad categories, shown in Table 1.

Subject Category	Occurrences	Frequency (%)
Solution Design	58	9.7%
Reverse Logistics	25	4.2%
Commercial	15	2.5%
Outsourcing	13	2.2%
Infrastructure	11	1.8%
Renewables	9	1.5%
E-business	6	1.0%
Waste & Recycling	4	0.7%
Metadata	2	0.3%
RFID	1	0.2%
Other	456	76.0%

Table 1: Subject Analysis of 600 articles from 2013 (ZETOC)

The results of this initial sample show academic literature to be broad and diverse, with no single subject accounting for more than 10% of the total.

The appearance of solution design, a mathematical discipline focused on creating algorithms that can be incorporated into software for logistics planning, as the most common subject of an individual article is a reflection of the strengths of the academic community.

However, the appearance of reverse logistics in second place is notable, since it reflects a substantial funding stream across Europe for a single issue.

In the second stage of our analysis, we looked at the consistency of publications of articles covering these main subjects over time. Table 2 shows the frequency of publication from 2010 until April of this year.

Keyword	2010	2011	2012	2013	2014 (4 months)
Logistics	2142	1982	2087	2158	151
Solution Design	270	264	249	178	62
Reverse Logistics	80	83	89	98	39

Table 2: Longitudinal analysis of key publication subjects, 2010 – 14 (ZETOC)

From this analysis, we can observe that the output on the subject of reverse logistics is increasing whilst the output on the subject of solutions design is reducing. This is a significant result, as the funding available for logistics research is generally under pressure, suggesting that reverse logistics is an area of research that finds favour with grant-awarding bodies.

Bibliometric Analysis of the Trade Press and Media

An initial analysis of the trade press and media was undertaken using the advanced search functions provided by Google, with manual intervention to remove duplicates and eliminate hits due to alternative meanings of the relevant search terms.

A sample of 120 hits (representing 384 articles due to multiple reporting) was analysed to identify the key stories published in the media in the twelve months from June 2013 to June 2014. The results are shown in Table 3.

Subject Category	Hits (Occurrences)	% Frequency (% Occurrences)
Company Performance	59 (223)	49% (58%)
General News / People	21 (45)	17% (12%)
Property	14 (43)	12% (11%)
Skills Shortages	9 (35)	7% (9%)
IT	6 (8)	5% (2%)
Trends / Reviews	4 (12)	3% (3%)
Decarbonisation	2 (6)	<2% (<2%)
Fraud	2 (8)	<2% (2%)
Rail	1 (2)	<1% (<1%)
Ports	1 (1)	<1% (<1%)
Historical	1 (1)	<1% (<2%)

Table 3: Subject Analysis of 384 articles from 12 months to June 2014 (Google)

The mainstream press can be clearly seen to concentrate on company performance, on general news such as awards and on key personalities. Reports in the specialist press are rarely reported by the general press, leading to a phenomenon whereby the most published articles are often not the most important from a whole industry perspective.

The larger global logistics companies, such as DHL and UPS, maintain research teams of their own to inform their own capability development and to assist in business development. One major report, “Logistics Trend Radar 2014”, was published by DHL in the same time period as the subject analysis

reported above. Figure 1 shows the summary of trends and the associated technology drivers that were identified by DHL.

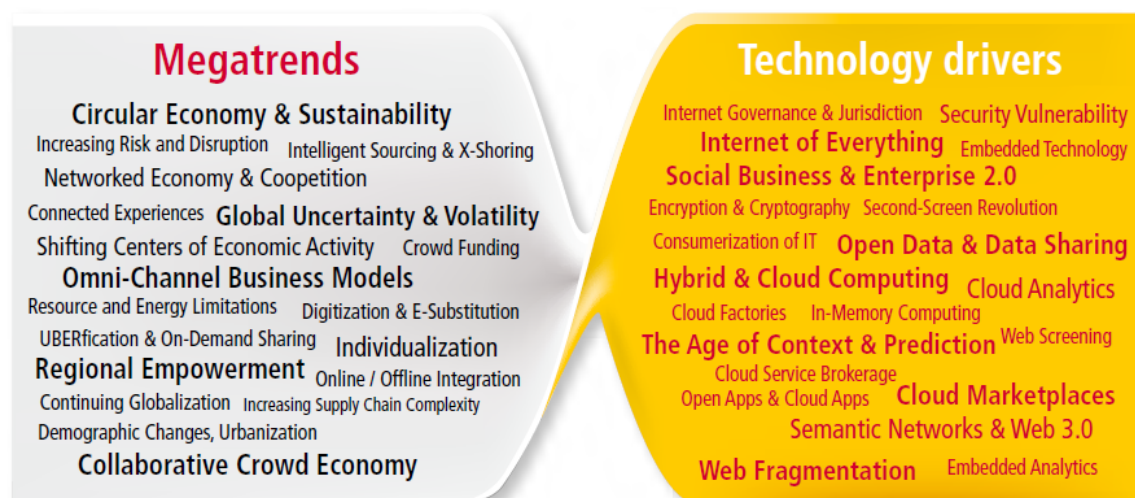


Figure 1: Megatrends and Technology Drivers in Logistics (DHL, June 2014)

The DHL analysis reinforces some of the themes arising in the academic literature, whilst adding concerns about supply chain vulnerability from the increasing use of “always-on” technology.

UPS offers a more industry-specific view of logistics solutions, concentrating on RFID technology, supply chain complexity and procurement. It is notable that UPS has maintained its focus on these three themes since 2005, suggesting that they have remained central to many businesses operational challenges throughout the past decade.

Leading IT companies such as Oracle continue to promote the advantages of supply chain visibility and of accurate forecasting.

In order to confirm the priority of the various themes arising from these industry sources, we returned to Google to conduct a simple frequency analysis of their identified trends and known operational challenges facing local logistics companies (Table 4).

Search Term	Hits	% Frequency
Supply Chain	857	
Supply Chain Skills	192	22%
Supply Chain Fuel Price	45	5%
Supply Chain Fraud	32	4%
Logistics	812	
Logistics Skills	119	15%
Logistics Fuel Price	26	3%
Logistics Fraud	11	<2%
Cybercrime	164	
Supply Chain Cyber Crime	7	4%
Logistics Cyber Crime	4	2%

Table 4: Frequency Analysis of Key Trends in 12 months to June 2014 (Google)

We observe that over a fifth of all articles relating to Supply Chain, and 15% of all Logistics articles in the non-academic press, have been concerned with the demand for skills.

Concern over cyber crime is primarily concentrated in the areas of identity theft and in consumer markets, rather than in voicing broader concerns about supply chain vulnerability. However, key influencers within the industry, and within law enforcement, are increasingly concerned about the lack of preparedness and supply chain resilience that many companies display.

Further reading

Heutger, M. And Kückelhaus, M. (2014): "Logistics Trend Radar: Version 2014", DHL. Available from http://www.dhl.com/content/dam/downloads/g0/about_us/logistics_insights/DHL_Logistics-TrendRadar_2014.pdf

Key Issues facing Logistics in Northamptonshire in the Medium-term

The combined outcome of our literature searches suggests that four key themes are pertinent to the NEP strategy for the logistics sector in Northamptonshire:

Theme 1: Reshoring - The Return of Manufacturing to the UK

Theme 2: Resource Efficiency – Reverse Logistics and The Circular Economy

Theme 3: Operational Challenges – The Day-to-Day Challenges Facing the Logistics Industry

Theme 4: Infrastructure – Road, Rail and Port Connectivity for the County

We present a broader discussion of each of these themes in the following sections. These four subjects are our considered selection and we accept that we could have chosen other subjects or other combinations of subjects. We will aim to show that the industry faces an interconnected set of risks to its wellbeing and future growth, a set that must be tackled in a coordinated and effective manner by national and local government and by the industry itself.

Theme 1, Reshoring, concerns the factors affecting current trends in inward investment.

Theme 2 is an amalgam of two issues that are often discussed separately. The Circular Economy and Reverse Logistics are often debated in different circles, since the former is considered policy and the latter operational. We believe that it is in the county's interest to connect the two, since the likely impact on jobs and growth within Northamptonshire is likely to be a complex outcome of decisions at national and at company level.

In tackling Theme 3, Operational Challenges, we discuss the fragility of the lean supply chain models that many companies operate, in the light of recent events such as natural disasters, fraud and theft. We also discuss the challenge of attracting suitable people to the industry, but have been careful not to repeat the work already published in this area, notably by SEMLEP, but to add to the debate by focusing on the responses that companies within the logistics sector have made to mitigate the effects of the skills shortage.

Theme 4, Infrastructure, is both a theme in itself and a common sub-theme in each of the preceding three discussions. Northamptonshire's present position at the centre of UK logistics has been gained on the back of its strategic location at the heart of the road network. In our discussion, we look at what needs to be done to maintain that leading position, with particular focus on intermodal connectivity and the recent counter-cyclical investments in port capacity in the UK.

Theme 1: Reshoring - The Return of Manufacturing to the UK

According to the EEF (formerly known as the Engineering Employers Foundation), nearly half of British businesses have some element of their production located overseas. Such offshoring of production has been an important trend in UK business over the past three decades.

The reverse process has been termed *reshoring*.

There are recent signs that the trend for offshoring is moderating and that some businesses are bringing their business back to the UK. For example, a survey carried out by the Manufacturing Advisory Service (MAS) Barometer⁶ in 2013 showed that 14% of businesses reshored some of their activities compared to 11% who offshored.

The aim of this section is to understand the reasons why businesses might have chosen to locate their operations overseas in the past, what might have changed in order to promote the reshoring trend that we can see in recent figures, and the potential consequences of reshoring on the logistics industry.

Synergies through co-location of logistics establishments

In a very recent paper from the Eindhoven University of Technology, van den Heuvel *et al* have established the synergies that arise from co-locating logistics companies in inland areas, away from coastal ports. Co-located logistics establishments are more likely to combine transport capacity, are better accessible, have better availability of repair and maintenance facilities and have better expansion opportunities for expansion than do non-co-located logistics establishments. These synergies form part of the location advantage that a region such as Northamptonshire enjoys.

Many of the companies that have reshored to the UK cite a supply chain advantage in doing so.

However, as our primary research will later confirm, logistics companies have a strong preference to site their operations close to their customer. If the location of manufacture alters, then the impact on the logistics sector can be profound, since the relocation of one logistics company to be nearer the new manufacturing base removes its contribution to the synergies enjoyed by the other logistics companies in the cluster.

Logically, therefore, the potential loss of location advantage can be avoided by encouraging the returning company to site its UK operations within Northamptonshire. Such a strategy requires a clear understanding of the factors that are considered when a company chooses to return its manufacturing to the UK.

The Manufacturing Location Decision

The commercial deliberations that lead up to such a decision are collectively referred to as the Manufacturing Location Decision and have long been studied by academics and theorists. In general, the decision should be underpinned by the concept of Transaction Cost Economics (TCE), which holds that businesses will naturally gravitate towards lower cost regions, all other things being equal.

More recent study has considered three factors to be involved: ownership advantages, location advantages and internalisation advantages. The twin concepts of ownership and internalisation

advantages are often referred to as the “make or buy decision” and lie outside the scope of this discussion. Reshoring is fundamentally a location decision.

Within the broad category of location advantage, several types of advantage can be identified:

- *Resource-based advantage*: concerns the possession of resources in certain regions.
- *Import-substituting manufacturing advantage*: includes (a) material cost, (b) labour cost, and (c) market and government trade policies.
- *Export platform manufacturing advantage*: considers low labour cost incentives provided by host governments for local production.
- *Trade and distribution advantage*: involves improved market access through closer proximity to customers.

Numerous consulting studies have been performed on this subject, though chiefly in the United States. A number of factors have been suggested as drivers of the trend in reshoring, including:

- The rising cost of fuel and associated transportation costs
- The rising cost of labour in low-cost countries
- The slowing of the global supply chain due to the shipping industry adoption of slow steaming
- Improvements in output/productivity
- The growing concern toward environmental issues
- Real and anticipated volatility in currency valuation
- Increasing theft of intellectual property when dealing in global regions
- The fast response time and leaner supply chain associated with locating manufacturing closer to the end customer/consumer
- Perception of quicker recovery in the case of supply chain disruption

In a recent BBC report discussing the decision of toy manufacturer Hornby to select a UK manufacturer for one of its product ranges, the agility towards responding to rapid changes in customer orders afforded by a UK location was highlighted, as was the long lead time for orders fulfilled from the Far East. Other reports in the mainstream media cite similar factors as being behind the decision to reshore.

A recent speech by the Prime Minister highlighted businesses ranging from food manufacturing (Symingtons) and electronics production (Sony), to services like call centres (EE) that had reshored some of their overseas production or service centres recently.

This rise in reshoring can be validated by the Markit/CIPS Manufacturing and purchasing index for the UK which resides at 57, indicating the strongest period of growth in the surveys 22 year history (Supply management, 2014).

According to a recent report in the Financial Times, the UK is now the cheapest place within Western Europe to manufacture goods, some 24% lower than France, 21% cheaper than Germany and 9% less than US firms.

In a bid to stop this leakage of growth to the UK, Vince Cable earlier this year pledged £100 million to strengthen the supply chain and give UK business the opportunity to maintain continual growth and support the continuing trend of reshoring .

The FT also acknowledges how wages in former low cost economies have risen, therefore making it inefficient to continue business in these regions. However, this does not mean firms will naturally migrate to the UK, it is still ranked 12th in regards to cost effectiveness to manufacture and any organisation looking toward the UK will do so under an obligations to maintain effective logistics.

PwC estimate that reshoring has the potential to add between £6bn and £12bn to the output of the UK economy at 2012 prices. They further estimate that between 100,000 and 200,000 jobs could be created by the mid-2020s as the country reduces its reliance on imports and turns instead to locally-produced goods and services.

Manufacturing, especially in sectors such as computers and electronic equipment, is expected to be a strong contributor to jobs growth. The textiles sector is also forecast to enjoy something of a renaissance, potentially contributing up to 20,000 jobs on its own, though forecasts here are cautious given the potential for high capital requirements.

Whilst such estimates are to be used with caution, given the wide range of the forecasts, even the pessimistic estimates represent a substantial opportunity to drive growth and jobs.

Groom (2013) wrote in the Financial Times of the desperate need for change in reform within the European Union to become cost effective and therefore more attractive to firms wishing to relocate due to the aforementioned cost rises in formerly low cost regions. However, we need to consider that in our current climate the UKWA suggests an increase of logistics labour demand to 2020, which is not already being met with current planning and investment levels.

Any further increase would therefore lead to an unsustainable logistics sector, arguably meaning any gains would be short lived due to resource restrictions. The conditions for successful reshoring are therefore intertwined with those already identified for rectifying the skills shortages besetting the logistics industry.

How is the Manufacturing Location Decision taken?

A company that has taken its business overseas but now wishes to bring it back to the UK will not automatically return to its previous location. Every Manufacturing Location Decision is a fresh one; the factors considered in the original offshoring decision must be updated to reflect the here and now of all potential locations.

A recent study by Lisa Ellram and her co-workers in the USA as sought to identify the factors pertinent to the MLD and to quantify the weight that is presently given to each factor. The summary of her findings, derived from a survey of 319 US businesses, is shown in Table 3:

Factor		Factor Loadings	
		Past 3 Years	Next 3 Years
Input/product	Currency	.750	.505
	Weight	.745	.491
Cost	Raw materials location	.600	.566
	Switching cost	.627	.733
	Labor cost	.751	.579
	Stability of labor cost	.680	.667
Labor	Availability of local management	.559	.807
	Availability of labor	.321	.778
Logistics	Availability of knowledgeable intermediaries	.719	.774
	Availability of transportation	.788	.794
	Stability of transportation cost	.552	.607
	Transportation reliability	.755	.576
Supply chain interruption risk	Distance to customer	.453	.514
	Terrorism	.786	.771
	Disaster	.759	.772
	Reputational risk	.625	.325
Strategic access	Market potential	.692	.610
	Customer presence	.463	.616
	Access to supplier or buyer knowledge	.610	.653
Country risk	Competitive pressure	.466	.533
	Global/political uncertainty	.619	.654
	Environmental issues	.672	.687
	Social/ethical	.575	.576
	Natural disaster	.510	.602
	Political instability	.610	.684
	Regulation risk	.617	.613
Government trade policies	Tax advantages	.756	.729
	Subsidies	.781	.830
	Countertrade requirements	.488	.376

Table 5: Drivers of Manufacturing Location Choice (Ellram *et al*, 2013)

In addition to providing a relative weighting of each factor, Ellram *et al* also provide an insight into how the perception of each factor is changing over time.

The most heavily weighted factor is currently the Availability of Transportation, which resonates well with Northamptonshire's position at the centre of UK road and rail logistics. Further good news is provided by the high weighting given to the Availability of Knowledgeable Intermediaries, a demand that NEP is well-placed to serve.

However, its position at the top of the list of priorities is to be overtaken in the near future by the Availability of Subsidies. It seems that the deciding factor in any future Manufacturing Location Decision may well be the amount of financial support that a region is prepared to offer in order to secure the inward investment. When the choice is between two geographically-close locations, such as between Northamptonshire or another location in the UK or EU, we believe that the ability to offer subsidies and incentives will become essential.

Concerns are also expressed at the Availability of Local Management, a factor that we will return to later in this document when we discuss the current skills shortages within the logistics sector.

Promoting Reshoring in Northamptonshire

PwC encourages national and local government to set up Centres of Excellence, citing the East London Tech City as a role model. Investment in more general schemes to promote sector-specific skills is recommended, with emerging roles for employers in partnerships with education and training providers.

PwC go on to urge that government continues to invest in upgrading the UK's infrastructure, especially its transport infrastructure, to counter a perceived weakness in that area. We will return to the subject of infrastructure in Theme 4 of this report.

PwC's final recommendation is that the UK should aim to maintain a simple, transparent and competitive fiscal regime for businesses to encourage them to relocate their activities back to the UK (or not to offshore in the first place). In general, the UK is already on track for this with the corporation tax rate set to drop to 20% by 2015.

Northamptonshire should interpret these recommendations as a vindication for its current initiatives within the Waterside Enterprise Zone and in its focus on key sectors such as Logistics to deliver its growth and jobs targets. However, they should also serve as a motivation to develop a programme of support to reach businesses that are in the early stages of considering the Manufacturing Location decision, wherever in the world they might presently be located. Northamptonshire's logistics advantages can be a persuasive factor, but must be professionally communicated to those companies considering reshoring.

The presence of a NEP office in Brussels is a welcome platform on which to build, but the degree of outreach that is implied by a concerted programme of attracting overseas businesses to invest in Northamptonshire is considerable and must not be underestimated.

Also, the climate that is presently conducive to promoting reshoring may change, possibly as early as next year if planned changes to the rates of corporation tax are reversed by an incoming government after the 2015 election.

Further Reading

Ellram, L.M., Tate, W.L. and Petersen, K.J (2013). "Offshoring and Reshoring: An update on the Manufacturing Location Decision". *Journal of Supply Chain Management*, 49 (2), 14-22.

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Theme 2: Resource Efficiency – Reverse Logistics and The Circular Economy

Reverse logistics encompasses all of the traditional logistics activities that we are familiar with in Northamptonshire, such as transportation and warehousing, but its focus has shifted to getting product back from customers rather than delivering it to them.

As we shall discuss, the Circular Economy initiatives place an obligation on manufacturers to recover waste and end of life goods from customers. It is this common focus on recovering resources from customers that causes us to combine our discussion of Reverse Logistics and the Circular Economy into a single theme, since we believe that Northamptonshire is favourably positioned to excel in both.

Reverse Logistics

Reverse logistics is part of the much broader supply chain management process of Returns Management. All activities relating to returns flow, logistics, effective returns authorisation processes and even policies designed to avoid consumer returns are implied by the term Returns Management.

If NEP is to understand how its interest in reverse logistics could create value for Northamptonshire businesses, it is necessary to understand both the marketing and logistics components of the process.

From a marketing perspective, an effective returns operation enhances the customer experience, reduces the perceived risk of an untried purchase (which is of great importance in internet shopping) and can also boost goodwill towards the company.

From a logistics perspective, returned products can be reinserted in the forward supply chain, can be refurbished or remanufactured, or be used as spare parts. This creates additional revenue for the company, reduces operating costs and minimises the opportunity costs of writing off defective or out-of-date products (see Figure 2).

Impact of Effective Returns Management

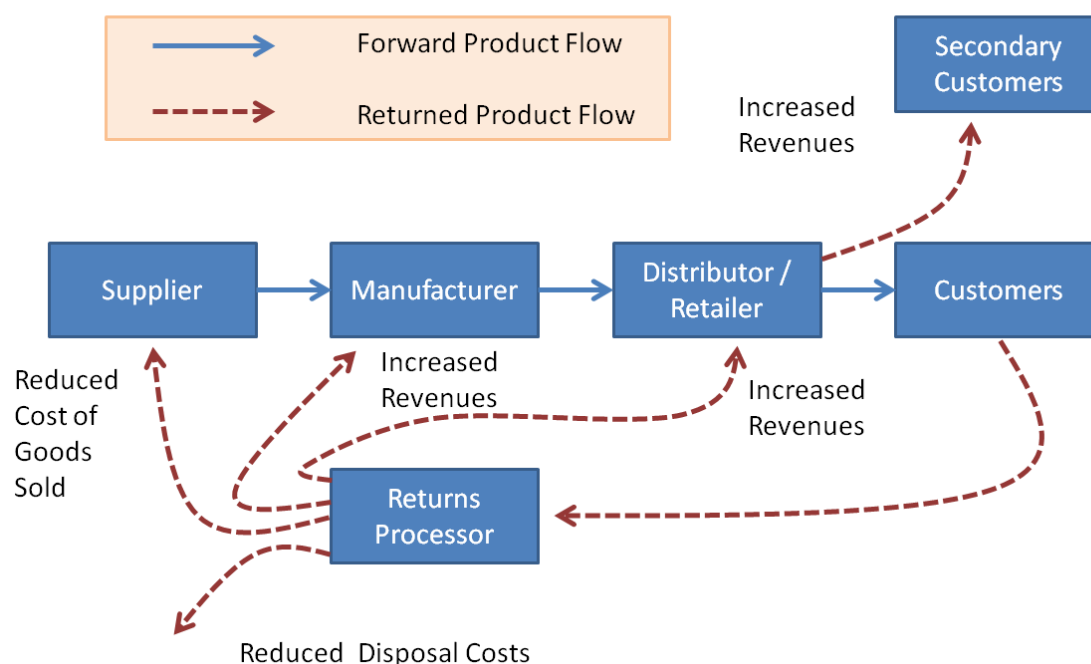


Figure 2: The Impact of Effective Returns Management (after Mollenkopf and Closs, 2005)

The financial impacts of doing reverse logistics well are also substantial and are summarised in Table 6 below:

	Returns Flow	Remanufacturing	Remarketing	Recycling	Landfill
REVENUE	Prompt customer service builds brand loyalty	Increase sales of remanufactured product, which is produced at a lower cost of goods sold (COGS)	Sell recovered and remanufactured products and parts through alternative channels	Recycle parts & materials that can no longer be used in products	Environmentally responsible activities enhance brand equity
EXPENSES	Reduce COGS by reclaiming useable parts	Reduce COGS by refurbishing or remanufacturing		Reduce operating expenses through disposal compliance	Reduce operating expenses through disposal compliance
ASSETS	Reduce obsolete inventories by improving channel-clearing activities		Prevent accumulation of old stock by actively remarketing to alternative channels		

Table 6: The Financial Impact of Reverse Logistics Strategies (after Bernon *et al*, 2011)

It is not easy to make a business case for reverse logistics. Whilst it is often easy to identify the cost implications of allocating resources to reverse logistics, it is often much harder to identify the impact on revenue.

From a county perspective, however, reverse logistics jobs are incremental to those engaged in normal “forward” flow, the physical returns are incremental to normal parcel flows and the customer contact element represents a further increment again.

If NEP were to develop a twin strategy of increasing awareness of the marketing aspects of effective reverse logistics, whilst simultaneously providing mentoring and other support to companies wishing to increase their performance in this area, the county could expect to see logistics companies develop their current returns management activities.

Returns management activities are conducted on a smaller scale than normal outbound operations, often with the result that output efficiencies are much lower and therefore more labour-intensive. Job creation could therefore be significant and would be expected to build on the strategic location of the county at the heart of the logistics network.

Towards A Circular Economy

The term “Circular Economy” relates to an industrial economy that is inherently restorative in nature. The concept has been debated in academic circles since the early 1970’s, notably by Walter R. Stahel, whose advocacy of a “closed-loop” approach to production processes achieved widespread recognition.

The specific term “Circular Economy” came to prominence as a component of China’s 11th five-year plan, starting in 2006. It has since passed into more popular use through the publicity afforded by the Ellen MacArthur Foundation, which campaigns for an end to the “Take, Make, Dump” nature of our modern way of life.

The concept draws a parallel between its ideal economic system and biological systems. The commonality is readily apparent from Figure 3 below.

The basic principles are as follows:

1. Waste is Food: Every component of every product is designed to be disassembled and reused in some way.
2. Diversity is Strength: Diverse systems are much more resilient in the face of shocks than systems that have been optimised for efficiency alone.
3. Energy must come from renewable sources: The use of finite resources such as fossil fuels is not sustainable.
4. Systems thinking is the norm: It is critical to understand how things influence one another within a whole.

The European Commission is expected to present an ambitious statement on the next steps towards a circular economy for all EU member states on the 1st July 2014. The plan will be written by Francois-Michel Lambert MEP, who is President of the Institute for Circular Economy (IEC) in Paris. A draft bill is scheduled to be introduced to the European Parliament during 2017.

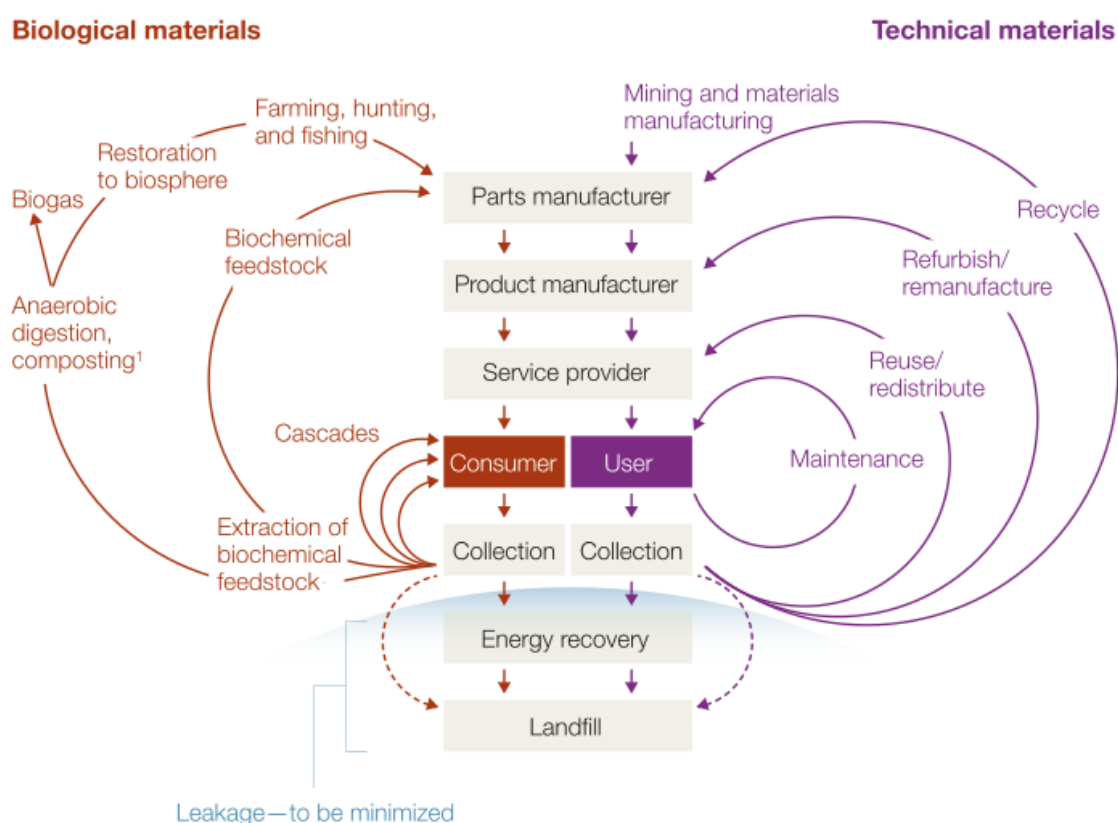


Figure 3: Biomimicry and the Circular Economy (Ellen MacArthur Foundation, 2013)

We believe that the relevance of the principles underpinning the Circular Economy movement to Northamptonshire is much greater than the phased transition to a low-carbon economy that already planned.

The necessity to design products with their end of life in mind, and then to dismantle them and recover the resources from them, are activities that fit very well with the logistics sector that is so well-represented in the county economy. The diversity of SMEs that can be expected to respond to the increased demand for reuse, refurbishment, remanufacturing and recycling activities will create a stronger, more resilient local economy - an uncertain world rewards modularity, versatility and adaptiveness. The adoption of systems thinking will promote a new understanding of the economy as a network of businesses that feed on, and feed off, each other.

The role of NEP should be to promote early adoption of the principles of the circular economy, well ahead of legislation, thereby creating first-mover advantage for entrepreneurs in the county, and by providing support for existing businesses diversifying into the post-consumer sector.

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Theme 3: Operational Challenges – The Day-to-Day Challenges Facing the Logistics Industry

In the UK, it is rare to come across a company that considers their supply chain to be strategic differentiator. Merchandising skills, product design, or brand equity are each more likely to be cited as the reasons for a company's success than supply chain management.

However, companies with the best supply chain and procurement skills will always win in the long run, since their ability to respond to changes in demand will mean that they will suffer fewer costly stockouts and overstock situations.

The logistics and supply chain industry is obliged to continually face up to a range of operational challenges that beset them every day. In our analysis of the trade press, it is clear that any success in these endeavours is a hard-fought victory, given the often low priority that investment in the supply chain is afforded by the very companies that rely on it to meet customer demand.

Skills shortages

There has been much discussion within the logistics sphere relating to skills shortages and this has been born out in the media, trade press and in statements made by industry bodies.

Even the Prime Minister, David Cameron, has not lost sight of the challenge the logistics industry is undertaking, acknowledging the skills shortage in the sector in a speech in 2012 and again in 2013, this time in relation to lack of skills in public sector procurement.

In 2013, the South East Midlands Local Enterprise Partnership (SEMLEP) published a major report into the ways that logistics companies attract, develop and support their staff. SEMLEP concluded that logistics was "a sector needing new blood and increased levels of talent and competence".

Unpublished work from the University of Northampton has shed light on the scale of the most common response to mitigating the shortage of good talent, namely the influx of Eastern European workers to work in the logistics industry. It is by no means uncommon to find that the majority of the workforce in a large warehouse was born outside the UK, with Poland, Lithuania and Latvia the most common origins.

We are aware of one facility with a workforce that is close to 85% Polish, and of one agency in Northampton that has 95% of its candidates registered from Eastern Europe. We are also aware of facilities that have predominantly Eastern European workers in shop-floor roles, but other nationalities (not always British or Irish, but also Portuguese and other Western European nationalities) in managerial and supervisory roles.

The implied lack of progression for Eastern European workers is unhealthy. These are typically young, well-educated people who are prepared to work their way up through an organisation, but find themselves facing the need to seek advancement outside of the company they are working for.

This 'shortage' of talent is far from a UK-only phenomenon, with a Chinese delegation on a recent visit to Unipart (West Midlands) revealing a similar lack of skills in the Asian market to support the growing needs of the logistics industry.

This conclusion was further ratified by the cancelation of proposed expansion to the Hong Kong logistics hub, due to the lack of available logistics professionals to support the required growth plans. Given that 14.3% of the world's freight currently routes through this logistics pinch point, any shortage of skills will undoubtedly have an impact on the wider holistic supply chain.

Within Europe, a study into logistics sectoral skills shortages by Price Waterhouse Coopers (PwC) suggests more needs to be done regards investment into training and also adapting working conditions to cater for an older workforce.

Small to medium sized enterprises are well-known to suffer at the hand of constrained resources and budgets. This is where it is suggested that alliances be formed between logistics companies to spread cost and foster innovative sustainable training and recruitment processes, to support the growing demands placed upon the sector.

Inside the confines of the UK, the UK warehousing association (UKWA) suggests the logistics sector will need to recruit an additional 900,000 workers by 2010. In an attempt to bridge this divide there was an increase of 29% in 2012 for logistics related apprenticeships, which placed an additional 15,760 extra staff in the system.

Even if investment and adoption of apprentices continue at this same rate and ignoring attrition and retirement, the scheme will not deliver the resources required, since the total new recruits to the industry will be 110,320, representing a shortfall of 889,680 based on the UKWA demand forecast.

Many commentators also cite the impending deadline by which existing HGV drivers must complete the Certificate of Professional Competence (CPC) as an additional factor leading to skills shortages. The Freight Transport Association has reiterated its warning that there will be no last minute reprieve and that the law will be enforced from the 14th September 2014, when the deadline passes.

As at April 2014, the Driver and Vehicle Standards Agency reported close to 450,000 drivers had gained the relevant CPC certificate that would allow them to continue driving under the new legislation. This figure must be contrasted against the same agency's estimate that the total number of professional drivers is close to 750,000, implying that up to 300,000 drivers still need to take the CPC test.

Natural disasters

The World Economic Forum released the results of a study which drew a comparison on the many supply chain risks affecting today's businesses. At the top of the risk register for both 2011 and 2012 appear extreme weather events and natural disasters.

Validating this threat to business profitability, insurer Allianz, places this same metric (extreme weather & natural disasters) in second place behind "business interruption, supply chain risk" in their 2014 report 'Top 25 Business Risks' (Figure 4).



Figure 4: Allianz Risk Barometer on Business Risks 2014

The Chartered Institute of Purchasing and Supply (CIPS) analysed this report and found that 50-70% of all insurance claims within the logistics sector belong to the extreme weather category, which raises the question over the long-term sustainability and affordability of insurance for logistics and supply chain SMEs.

To appreciate the affect that natural disasters can have on the profitability of businesses within the Northamptonshire region, a quick review of the holistic supply chain, with it's propensity for extended logistics operations, frequently comprised of globalised outsourced networks, only serves to identify how exposed various nodes of the chain are to these events.

Looking back to 2010, the volcanic ash cloud from Eyjafjallajökull grounded in the region of 100,000 flights, with a loss of revenue to the airline industry of \$1.7 billion and with the UKs heavy reliance on fresh imported food, most of which utilises the air freight transportation mode, a risk to the sustainability of the local food chain.

A further global example can be seen with the 2011 floods of Thailand. Not only did the flooding cause the price of raw materials connected to the high tech industry to increase, but furthermore left an estimated bill of \$1.5 billion for the insurance sector. Supply chains supporting Northamptonshire's thriving high-performance engineering sector and the successful UK space sector could be put at risk by a similar event in the future.

Only last year (2013) Typhoon Yolanda wreaked havoc across the Asia Pacific causing some 200 container vessels to be port-bound for 5 days. Those are days the supply chain will never claim back and represent numerous days of inventory that could not be sold.

Earlier this year (2014) the UK experienced one of the worst flood events in recent history, causing logistics networks to grind to a halt and placing swathes of agricultural land underwater. NFU Mutual, the largest farm insurer, stated they had over 8,000 claims in the aftermath, with early estimates of payouts reaching £60 million.

With Northamptonshire's focus on food and drink, the farming industry plays a crucial role in ensuring the success of the food manufacturing and hospitality sectors. Natural disasters in the shape of extreme weather events could cause yields to dramatically decrease, potentially bringing the supply of raw materials to a standstill. This was witnessed in the 2007 floods, with reported losses per farm at £89,000.

In addition, with an already over reliant supply of imported food, any event that stems the flow of raw materials within the UK could result in an increased reliance on imports, inflating logistics costs and imposing further risk on the logistics networks that support these vital supply lines to local Northamptonshire businesses.

Logistics & Supply Chain Security.

In 2013, Deloitte interviewed 300 Chief Executives from the Forbes Fortune 500 and in doing so found that 71% of respondents maintain that supply chain resilience is their number one concern when it comes to maintaining a firm's profitability.

Even with this desperate need to maintain resilience, 45% went on to admit that their organisations have little or no analytics for measuring logistics and supply chain risk.

Historically, the global community has been reactive rather than proactive to threats. A key finding of the 9/11 report was that proactive sharing of data could have stemmed the terrorist activity from taking place, and several commentators maintain that the same approach to information sharing is the key to mitigating the risks of supply chain disruption.

In globalised times, where data is the key driver behind good logistics and supply chain practice there is an inordinate amount of data being held by organisations which is simply not being put to good use.

An exception is Quaker, who have collated data on weather patterns to measure their supply chain risk and to use as a tool to make strategic logistics network decisions. By embracing the use of analytics Quaker has increased yields of their crops and optimised manufacturing capacity, in the process indicating how analytics and 'big data' can be used for effective logistics management.

Fraud

There is however another more sinister side lurking inside of logistics, a side that analytics and big data can also assist with. According to Bureau Van Dijk, fraudulent activity within European logistics and supply chain networks topped half a billion pounds sterling in 2013, a 38% increase on the figure reported in 2012.

Interpol seized 1,200 tonnes of fake food and 430,000 litres of counterfeit drink toward the end of 2013. In May 2014, 9.4 million fake pharmaceutical goods were seized; in January 2014, 60,000 bottles of counterfeit champagne were confiscated.

In 2014, a sting operation uncovered fake electronics and vehicle parts worth millions of Euros destined for UK businesses.

Fraudulent activity represents only one aspect of the situation, since theft has risen sharply since the recession. Specifically within logistics, there was £25 million of finished goods stolen from trucks according to the West Midlands Police statistics 2012 (BBC, 2012).

Data from the Home Office report (2013) into crime statistics, shows that the wholesale and retail sectors suffered 19,701 crimes per 1,000 premises, transportation and storage sector suffered 506 crimes for every 1,000 sites and that the manufacturing sector suffered 1,500 crimes per 1,000 sites. The principal concern is that these sectors comprise a large section of SMEs who cannot afford to take direct hits to the bottom line or increases in insurance.

According to the Chartered Institute of Purchasing and Supply (CIPS), this fraudulent activity is on the increase, with average individual cases reported to be £2.9 million.

Examples of cases that have recently been exposed are:

- the £5.5 million NHS supply chain fraud,
- the horse meat scandal of 2013 which was responsible for decreasing meat sales by 43%,
- goods lost in transit fraud (GLIT) totalling £405 million for 2012, which may have completely eroded the profit margins of many e-businesses, and
- the substitution of food ingredients with lower cost substances, leading to potential public health issues.

All of these areas expose Northamptonshire businesses to risk and unnecessary cost. Allianz (2014) places cyber crime, fraud and theft in 8th and ninth places in their 'Top 25 business risks', up seven places from the 2013 survey and comprising 22% of the overall business risk.

We believe that the collaborative use of big data, coupled to analytics across Northamptonshire logistics organisations could potentially enable the county's logistics and supply chain businesses to view disruptions ahead of time, assist in mitigating risk and bring greater resilience to their business operations.

We believe that NEP's current policy of promoting business resilience within the country should be enhanced with specialist seminars and workshops covering these emerging and interconnected risks.

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Theme 4: Infrastructure – Road, Rail and Port Connectivity for the County

In the years immediately preceding the economic downturn in 2008, many commentators were becoming worried about the inexorable rise of road transport volumes and the apparent inability of the UK economy to grow without adding to traffic congestion. For many years, growth in output has resulted in an equivalent growth of road freight, as shown in Figure 5.

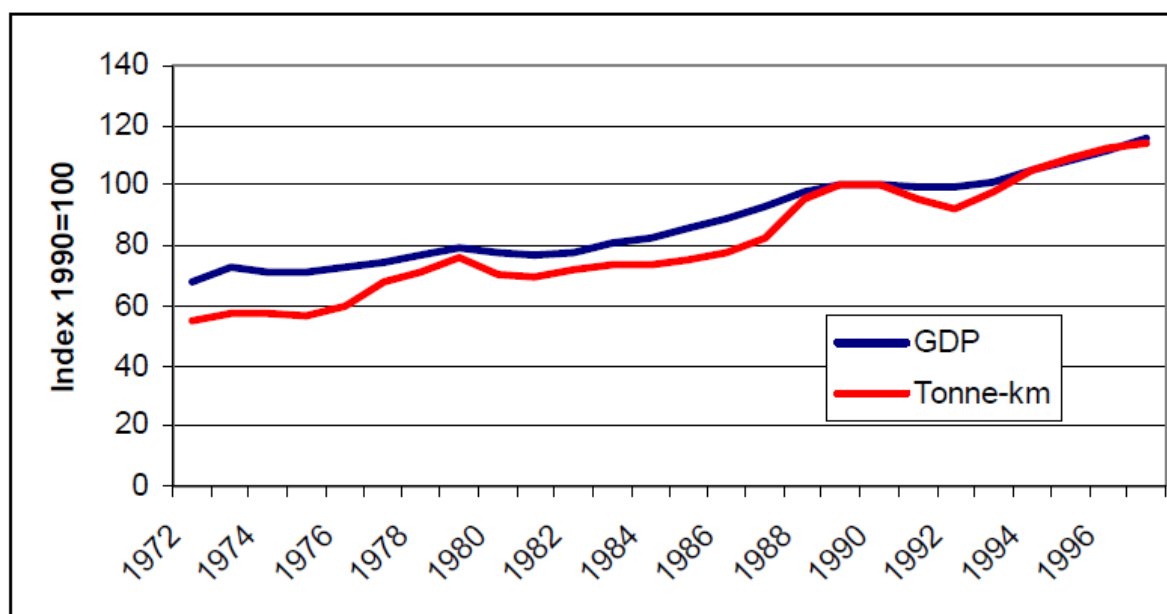


Figure 5: Correlation between road freight tonne-kilometres and UK GDP growth (McKinnon, 2007)

Writing in 2007, Professor Alan McKinnon (then of Heriot-Watt University) extrapolated the then current trend lines and concluded that the growth in HGV traffic would lead to a total of 30 million 32-tonne lorries by 2205, a clearly unsustainable situation. Successive governments, both in the UK and abroad, have considered the decoupling of road freight from GDP as a “holy grail” of transport economics for many years, but so far without significant success.

Whilst some decoupling was observed after 1998, only about one-fifth of the reduction in road freight tonne-kilometres was attributed to a shift to more sustainable modes of transport, such as rail. The largest effect was put down to the penetration of the UK market by foreign hauliers, who were not required to report their activity to the UK authorities, resulting in under-recording of the true level of freight activity. Once this activity was added back, the long-term trend was re-established.

Professor McKinnon also established that the price elasticity of road transport is rather low. To a first approximation, for each percentage point increase in the cost of haulage, tonne-kilometres only reduce by 0.1%. This remains an interesting observation today, given the deliberate intervention of government in consistently driving up the price of diesel. In the absence of any other freight solution, road transport remains the dominant mode of transport, carrying two-thirds of freight by volume.

A further factor identified by Professor McKinnon was the tendency for spatial concentration, which has been observed in many forms in many industries, driven by a desire for economies of scale (Table 7). Such concentration effects lead to an increase in the average length of haul and often to convoluted delivery routes via hub and spoke operations. This tendency is in some ways countered by the Working Time Directive, which has effectively placed a limit on the potential to increase trip length.

Primary production	Extraction of minerals is concentrated at only a few viable sites
Manufacturing	Economies of scale by concentrating production in fewer, larger plants
Stockholding	Centralisation of inventory
Sortation	Evolution of pallet and parcel delivery through “hub and spoke” networks . Partly a response to JIT manufacturing and partly a product of home delivery
International freight	Fewer, larger, ports and airfreight hubs have gained market share
Waste management	Landfill capacity in the UK has become concentrated in a smaller number of larger sites

Table 7: Examples of spatial concentration

Northamptonshire has been a beneficiary of these changes, both as a location at the heart of the centralised network that the majority of larger logistics companies operate, and as a focus for inward investment by foreign hauliers (whether by growth or by acquisition).

However, we cannot escape the conclusion that the current parallel growth of GDP and road freight must come to an end, and that modal shift will be encouraged, for the good of us all. Neither can we escape the conclusion that any solution will take time to implement nor that our current road-based industry must remain a strong contributor to the local economy until the infrastructure is in place for the industry to manage an orderly transition to a more sustainable solution for freight.

Investment in Infrastructure

The rate of investment by the UK in its road infrastructure is behind that of our competitors, notably France, Germany, Austria and Spain. For example, investment in England’s road infrastructure fell sharply in the 1990s, from over £2bn to less than £400m and has remained relatively low today. Traffic continued to rise and unlike other nations, we did not try to keep up (Figure 6).

Even in the worst economic circumstances and assuming low population growth, traffic on the strategic road network is predicted to rise by 24% by 2040. The central case predicts a rise of 46%. This growing demand will place great pressure on the road network and will increase congestion, to the point where each household can expect to spend 70 hours per year stuck in traffic, equating to 100 million lost working days and a £14bn cost to the freight industry.

The Department of Transport predicts that without investment “the M1 in Northamptonshire will start to resemble current conditions on the busiest parts of the M25”.

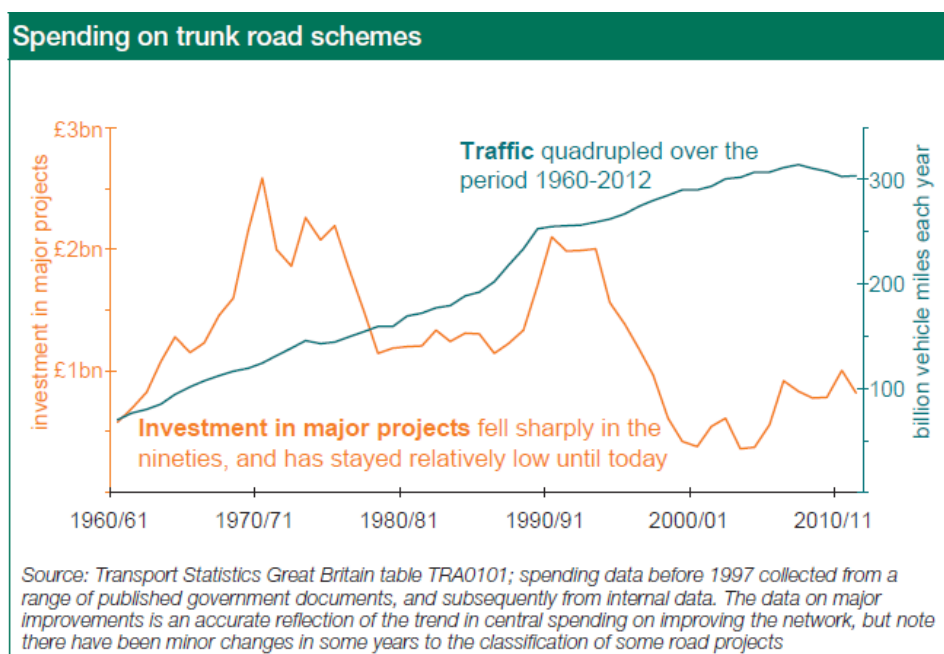


Figure 6: Spending on trunk road schemes (Department of Transport, 2013)

In the recent White Paper “Action for Roads: A Network for the 21st Century”, the coalition government announced a tripling of investment on national road schemes, recognising that better transport, better infrastructure and better performing roads are all necessary to promote economic recovery.

The core proposals of the White Paper were confirmed in the recent Queen’s Speech, contained within the Infrastructure Bill to be laid before Parliament as one of the last acts of the present coalition government before the election in 2015.

A total of 52 major projects have been announced, of which 23 will begin by 2015 and the remaining 29 placed into a pipeline of projects commencing after the election. Within our region, the A5/M1 link at Dunstable and improvements to the A14 at Kettering have been approved, as have the improvements to the M1 at Junction 19. The planned improvements to the M1 between Junction 13 and Junction 19 have been agreed in principle and placed in the pipeline.

In addition to the major projects, 120 smaller schemes have been announced with the intention of tackling local pinch points in the road network. Of interest to Northamptonshire are the improvements to the A5 and A43 near Towcester and the northern approach to Northampton via the A43. Many logistics companies will also welcome the planned redesign of the A43/M40 interchange at Junction 10 which is planned to commence in September 2014 and the further improvements to the A34/M40 intersection at Junction 9 near Bicester which are in progress.

The published map of the combined major and pinch point projects is reproduced in Figure 7 below.

In our view, these road projects are welcome and vital to the mid-term viability of logistics in Northamptonshire, but do not fundamentally address the necessity to engineer a shift away from road transport towards more sustainable modes of transport, notably rail.

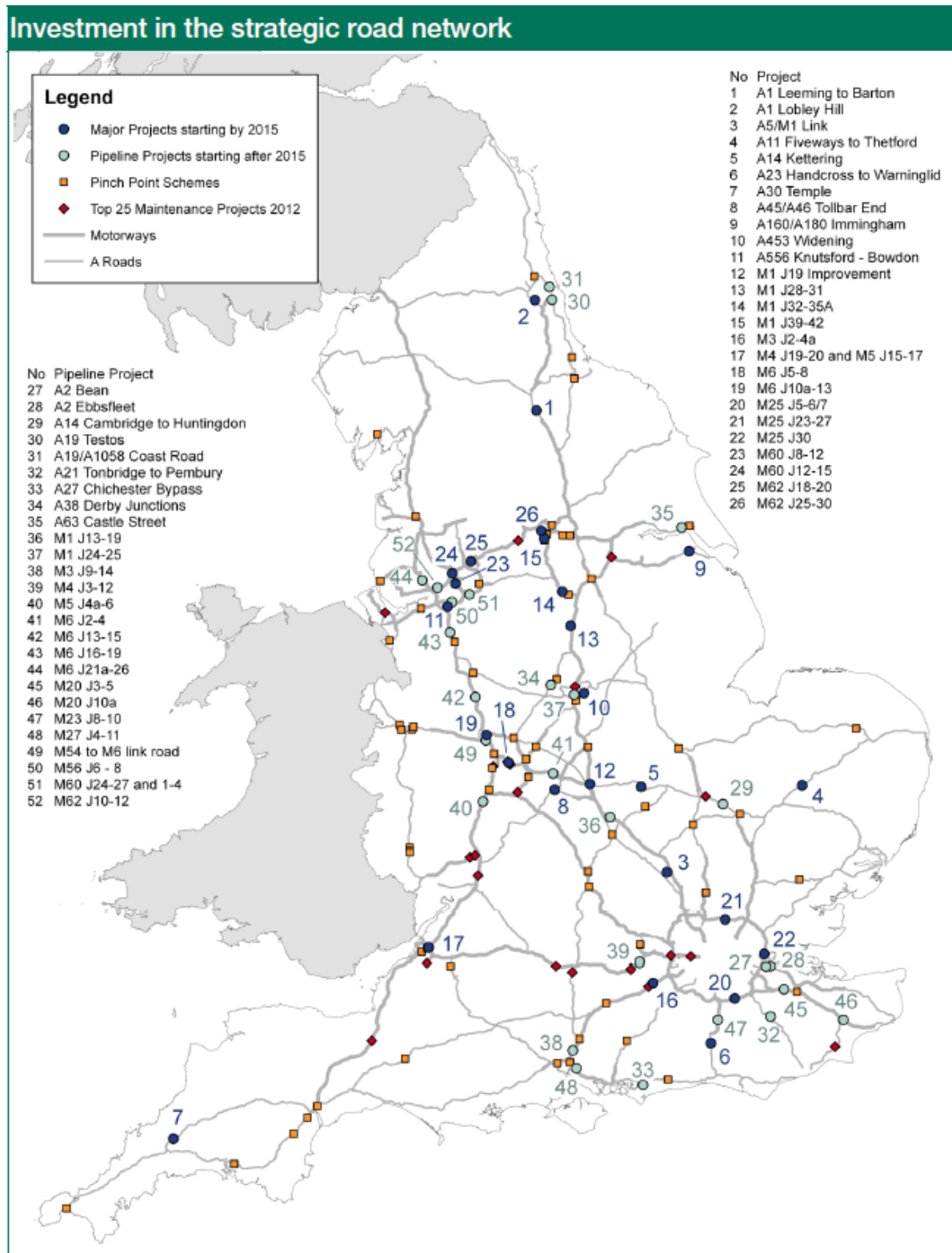


Figure 7: Investment in Strategic Road Network Schemes (Action for Roads , 2013)

Counter-Cyclical Investment in Port and Rail Infrastructure

Between 2006 and 2013, including during the deepest parts of the recession in the UK, a number of significant investments were made in the UK's strategic port and rail freight infrastructure, chiefly by overseas investors.

The Port of Felixstowe is currently the UK's largest multimodal terminal, handling between 10,000 and 11,000 containers per week, representing close to 30% of the port's overall volume. The port's operator, Hutchison Ports (UK) has invested nearly £40m in developing the new North Rail Terminal, which is claimed to have a capacity larger than that of Tilbury, Bristol or Liverpool.

This private investment by Hong Kong owned Hutchison Ports (UK) sits alongside the improvements to the regional rail network undertaken by Network Rail, which have improved connectivity to major UK destinations at a cost of £144m.

By the year 2020, up to forty 30-wagon freight trains could run in and out of the terminal in a day, removing close to 500,000 lorry movements from the surrounding roads in one year.

Over roughly the same time period, Dubai-based DP World has implemented the first phases of the London Gateway port, on the site of the former Shell Haven terminal near Thurrock on the Thames Estuary. Construction began in February 2010 and the first vessel docked in November 2013.

Construction of the terminal and its associated logistics and rail infrastructure is scheduled to take place in stages until at least 2025. The total investment by DP World and its partners may reach £1.5bn by this point.

DP World maintain that the new port has the potential to drive out logistics costs, since it is positioned closer to the major point of consumption, namely London. In academic circles, these claims have rekindled a long-standing interest in port-centric logistics, which challenges the assumption that inventory should ideally be placed at the centre of mass of the population, in favour of a design that sees inventory kept within the port.

Since justification for siting large warehouses in Northamptonshire and the Midlands is based on this same centre of mass assumption, many commentators, and DP World themselves, have predicted a shift of logistics activities towards the new ports. However, even though the ports are large, they cannot expect to accommodate all UK-bound inventory and there will still be demand for storage in cheaper locations.

In the short-term, however, the competition between the new port-centric facilities and the traditional locations in the Midlands will be fierce. Companies facing these strategic decisions are making a leap of faith if they move away from their traditional solutions and may feel nervous about doing so.

An example of this quandary is provided by Marks and Spencer, which recently reversed out of an agreement to occupy a port-centric facility at London Gateway in favour of remaining in Castle Donnington.

High Speed 2

In many ways, the HS2 project suffers from its name. The present campaigns against HS2 focus on pitting the very high cost against an apparently small reduction in journey time. Such an approach misses the point, from this county's perspective.

The challenge is to ensure that a proper complement of benefits accrues to this region. For once HS2 is open, the expected response from the existing train operators is that they will most likely implement the additional passenger services that they need to recover the revenue lost to the new line. Whilst this is likely to be welcomed, such a unilateral response would shut the door on a unique opportunity to encourage modal shift.

Any investment in rail capacity, be it high speed or not, has the potential to release capacity on the existing rail network. The capacity released can be used for increasing the quality of local services or, crucially, the development of rail freight as a credible alternative to road.

However, unless the UK has a vibrant, competitive rail freight industry by the end of this decade, it is likely that rail will not be able to attract the volume of goods onto the West Coast Main Line to take up the full complement of paths that will be potentially available to the industry.

Northamptonshire can play its part in developing the competitiveness of the rail freight industry by facilitating the development of DIRFT and CIRFT as centres of intermodal excellence. Significant expansion is already planned at both locations. The proponents of these projects see benefits now, but these are no short term plans. If Northamptonshire is to respond to the threat from the deep-water ports, strategic projects such as the development of DIRFT (and potentially CIRFT) as inland ports to facilitate East-West distribution should be evaluated.

Inland ports are not a new concept in the UK - Norwich was a leading inland port in the eighteenth century – but the concept has found new favour in the light of the challenges of encouraging modal shift.

Such projects have already found favour in Doncaster, where the regeneration of the Rossington Colliery includes the development of a Strategic Rail Freight Interchange and inland port. The funding for this project comes from a Canadian pension fund, the Healthcare of Ontario Pension Plan (HOOPP).

East Midlands Gateway, next to East Midlands Airport, is the proposed site of another interchange. Planning permission is yet to be granted for the site and significant local opposition exists towards the plan.

Both DIRFT and CIRFT are ideally positioned to build on their current success, but will need to thrive against competition from very well-funded inward investors.

Further Reading

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Primary Research

This section presents the findings of the primary research phase of our study. These are the views that were gathered throughout June 2014 from over 300 respondents to our online research questionnaire.

The questionnaire was designed to test the initial findings of the secondary research. A variety of question types was included:

- a) Ranking of factors affecting business performance
- b) Impact of key logistics trends on current business
- c) Free text responses

A total of 341 useable responses were received from a total of 1298 invitations, representing a response rate of 26.3%. This level of response exceeds the generally accepted criteria for statistical sufficiency for a group of this size.

Business demographics were also captured as part of the process, in order to detect any variation of responses in relation to the scale and geographical spread of businesses (see Appendix A). The questionnaire itself may be found in Appendix B.

Ranking of Factors Impacting on Logistics Performance

In our secondary research, we identified a range of operational challenges that beset logistics companies in the conduct of their day-to-day business. The primary questionnaire included questions designed to confirm our assumptions concerning the importance of each factor.

In addition to asking the respondents to rank factors in order of importance, we also asked the respondents to agree or disagree with specific statements, providing a semi-quantitative response from strong agreement (5) to strong disagreement (1). Such a question, if properly designed, has an expected outcome of neutrality (3). The strength of feeling on a particular topic can be judged by the deviation from this neutral position; any deviation larger than 1.0 is likely to be highly significant.

Skills shortages

First amongst these, based on prior reports by Skills for Logistics and others, was a chronic shortage of skilled workers. Our survey confirmed this, with just under half of respondents reporting that they had experienced a skills shortage in the past 12 months.

<i>Has your business experienced a shortage of skilled logistics workers in the last 12 months?</i>	
Yes	49.1%
No	50.9%

The respondents offered several reasons for this situation. Firstly, they did not believe that potential candidates for jobs within logistics properly understood the industry (-0.71 against a neutral view). Secondly, they believed that women were under-represented in logistics (-0.49).

The shortage of skills was also reported by non-UK respondents, indicating that this issue is of concern across Europe. The availability of skilled labour was also considered the most potent economic constraint affecting logistics.

The group was very receptive (+1.24 from a neutral position) to the suggestion of a full educational pathway (from apprenticeship to undergraduate degree) that might be used to attract people into the industry with the potential for continuing education whilst employed.

Performance Indicators

Traditionally, performance has been closely associated with key indicators such as fuel efficiency, vehicle fill and drop density and whilst this focus has not lessened, companies are increasingly setting targets for reverse logistics and recycling.

The use of alternative fuels in vehicles and alternative energy in warehouses, though often the subject of press releases by logistics companies and a common feature of real estate marketing, does not play a crucial role in performance monitoring. However, the respondents felt that their logistics infrastructure decisions took clear account of recycling options and of the availability of alternative fuels (+0.91).

<i>Please rank the following resource efficiency metrics according to the manner they affect your business (1=highest and 7=lowest)</i>		
METRIC	Average rating	Rank
Fuel Efficiency	2.39	1
Vehicle fill	3.08	2
Drop density	3.49	3
Reverse logistics	4.39	4
Recycling	4.58	5
Alternative fuels (vehicle)	4.98	6
Alternative energy (warehouse)	5.10	7

Impact of Key Logistics Trends on Current Business

Location decisions and reshoring

The majority of businesses responding to the survey saw their main focus as being close to the customer. Only a few companies were concentrating on export activities.

<i>When reviewing logistics location advantage, which of the following pertains to your business?</i>		
OPTION	Response	Rank
Trade and distribution advantage (main focus is being close to the customer)	56.9%	1
Resource based (close to regional resources)	28.4%	2
None of the above	17.2%	3
Import substituting	15.5%	4
Export platform	8.6%	5

The importance of the road network to the logistics industry was confirmed, together with the pressing problems posed by traffic congestion and fuel costs.

Of the following, what do you feel is a logistics network constraint?		
CONSTRAINT	Response	Rank
Traffic congestion	53.9%	1
Facility location to major road networks	52.2%	2
Fuel costs	38.3%	3
Cut off times for major parcel carriers and freight forwarders	22.6%	4
Environment considerations	21.7%	5
Ability to have a true multi/synchromodal transport network	19.1%	6
Time from inland port to warehouse back door	13.9%	7
Location in terms of rail freight options	10.4%	8
Location to air freight options	9.6%	9

A further question confirmed the conclusion that the most important factor affecting the choice of business location was proximity to the customer. This was a contrast to the work done by Ellram and her co-workers, which placed a low priority on proximity to the customer; however the high rankings given to the availability of local staff and the availability of grants were entirely consistent with Ellram's work.

<i>Please rank the following factors when choosing a business location (1=most important, 10=least)</i>		
FACTOR	Rating	Rank
Distance to customer	3.30	1
Availability of local staff	4.02	2
Availability of local management	4.91	3
Distance from supplier	5.04	4
Availability of transport capacity	5.34	5
Subsidies / grants	5.75	6
Stability of transport cost	6.10	7
Availability of expert advice	6.44	8
Reliability of transport	6.48	9
Intermodal solutions	7.62	10

The low rating given to intermodal solutions is not surprising, given the dominance of road transport within the UK and Europe, but it is perhaps rather lower in absolute terms than we would expect. It is certainly indicative of the challenges facing the UK government in promoting the transfer of freight onto the railways, and of the likelihood that those companies that are most favourably disposed to rail may lie outside of the county.

We conclude that proximity to the customer is particularly valued by the logistics industry, but less so by the manufacturing sector. The rationale for the marketing of London Gateway as a premier logistics location with the advantage of close proximity to the largest market in the UK can clearly be seen in the responses to our survey.

The low ranking of intermodal solutions seen above was not repeated in the responses to a further question on the challenges of locating logistics facilities. Here, the proximity to alternative modes of transport was seen as a desirable factor that was in short supply.

Facility cost was, predictably, the factor uppermost in our respondents' minds. The high rating given to the quality of public transport provision, above more traditional complaints such as a lack of flexibility over the length of leases or contracts, was unexpected.

<i>Which of the following do you see as a logistics facility challenge?</i>		
FACTOR	Response	Ranking
Facility cost	54.8%	1
Location to alternative transportation	38.3%	2
Constrained by contract length	24.3%	3
Not on a public transportation route	24.3%	4
Lack of development	23.5%	5
Site security	18.3%	6
Constrained by size	18.3%	7
Constrained by type	13.0%	8
Other (please specify)	Nil	N/A

One fifth of businesses stated that their operations were being affected by current reshoring decisions, citing a drive for shorter lead times as the prime motivation. Several respondents indicated that the UK was behind other countries in terms of the availability of specialist advice and subsidies to attract their business:

"We would like to bring manufacturing back, however set up costs and lack of advice on location choice in the UK is pushing us toward Poland which is actively working with us to source solutions for our business in Europe, UK is missing a trick here".

"Yes, but no idea how to capture more of the market, are there Govt (local or national) that assist or educate in this area?"

"This is talked about with a lot of our customers, but no evidence from what we have seen in an upshift in European based manufacturing or a drive from local Governments to embrace it".

"As a small business we are all but precluded from decisions over manufacturing origin or how lead time affects our businesses, would prefer to see more done in this area to support the independents"

Business risks

A number of questions tested the response of the logistics companies to the issues set out in the Allianz Risk Barometer.

The respondents gave a lower ranking to the risk of disruption from severe weather, perhaps reflecting the tendency for logistics companies to take natural phenomena in their stride. The risk of fire and/or explosion was given a much lower ranking, perhaps reflecting the precautions taken in modern logistics facilities.

A higher ranking was given to theft, suggesting that the problems of shrinkage within the supply chain remain high on their agenda. Logistics companies are also much more concerned about their reputation and/or brand value than the broader Allianz group.

Please rank the following business risks in the order that they apply to your organisation

RISK	Rating	Rank	Allianz Rank
Business interruption and supply chain risk	3.50	1	1
Loss of reputation or brand value	4.29	2	6
Market stagnation or decline	4.86	3	5
Changes in legislation and regulation	5.00	4	4
Intensified competition	5.30	5	7
Severe weather and/or flooding	6.01	6	2
Theft, fraud, corruption	6.23	7	9
Cyber crime, IT failures	6.25	8	8
Quality deficiencies, product recalls	6.78	9	10
Fire, explosion	6.79	10	3

One-third of respondents indicated that they had been subject to supply chain fraud in the past 12 months. The respondents agreed that greater sharing of information between logistics operations at the regional level would aid in lowering logistics crime (+0.91 from a neutral position). Also, the level of fraudulent activity was considered to be a factor in the decision of where to site logistics facilities (+0.40), suggesting that Northamptonshire could gain a location advantage through initiatives aimed at lowering supply chain crime.

Reverse Logistics and the Circular Economy

Only 44% of respondents had heard of the circular economy and only a weakly positive response was observed to the question whether reverse logistics was important to their business (+0.30 from a neutral position). These are very disappointing figures.

A further question asked for suggestions as to how reverse logistics could be improved. The following statements are indicative of the responses received:

"Too fragmented, different offerings, confused market place".

"Too many differing views on this subject, some see it as waste only, others see it as the ability to cheaply move product back and there is a group whom see it as a joint venture to reduce cost and waste; get more clarity in this area before forcing it upon businesses and creating overly confused business models, as usual".

"More open discussion between businesses, rather than this protectionism that currently manifests itself".

"Said neutral as currently we are not in this area, not through lack of interest though, seems companies (smaller) are not interested in this as a pay service, assumed we will do it FOC".

"Cheaper costs from Logistic companies and not charging you a set journey when they have trailers coming back".

These responses display confusion between backhauling, which typically aims to avoid empty running of vehicle fleet, and reverse logistics, which aims to recover goods that have been returned

by the customer. A lack of willingness to collaborate was frequently cited as a barrier to improving performance.

Infrastructure

The respondents held a polarised view of the proposals for High Speed Rail, with as many opponents as supporters. A neutral position was adopted overall (+0.15).

However, investment in infrastructure was an agreed priority:

"Our railway problems go beyond capacity - future infrastructure is also an issue. Everyone used the same arguments for the Channel Tunnel but its benefit is surely obvious now...!"

"Infrastructural investment is essential to develop the UK beyond the London "halo" area. New opportunities will open up once HS2 is in place."

"I believe this investment should be channelled to other logistic projects."

"The UK has to invest in Infrastructure projects."

The respondents identified several major road intersections (e.g. M25 West of London, A34, A43, A14/M1/M6) as priorities for improvement. A general consensus was seen in support of the planned improvements to the M1 motorway between junctions 15 and 19.

Locally, improvements to the access to Brackmills and the Dallington/Duston area were recommended.

Conclusions from the Research

From our examination of the key trends operating within the logistics industry both globally and nationally, we can extrapolate their effects to determine a set of key impacts at the local level.

“Big Sheds in The Midlands” may not have had their day after all

Northamptonshire’s historic attractiveness as a logistics centre has been based on a business model that imagines a road-centric operation to distribute goods that have been predominantly imported through long-established ports such as Felixstowe and Southampton. Supply chains are long, with lengthy lead times from global trading partners that typically compete on the basis of cost.

The central location of the country has led many businesses to choose Northamptonshire as a location that can serve London, The Midlands and The North with equal service levels. Stock levels within the country are high, as the many square metres of warehouse space testify.

The investment made by port operators in new deep-water facilities in London and the South East represents a huge vote of confidence in the continuing dominance of the capital in UK consumer spending. New logistics facilities at the ports offer a credible alternative to the current distribution model, which sees UK inventory typically centralised in the Midlands. Such port-centric facilities, located in the hinterland adjacent to ports such as London Gateway and Thamesport, allow businesses to serve London directly, without the necessity to build inland facilities.

Port operators such as DP World are aggressively marketing their advantage over traditional locations such as Northamptonshire. Several key accounts have already declared their intention to relocate at least part of their business to London Gateway and others can be expected to follow.

Even though Marks and Spencer has recently reversed a decision to locate an import hub in Thames gateway, the arguments put forward by the port operators are compelling and may serve as a significant counter to the efforts of Northamptonshire to attract warehousing operations.

Moreover, recent investments in Midlands warehouse infrastructure have tended to be either North of the county (Lutterworth, Atherstone) or South (Milton Keynes, Enfield, Thurrock). There is therefore a concern that Northamptonshire may be “bracketed” by larger facilities with access to greater pools of labour.

Whilst we do not feel that there is likely to be an exodus of existing occupiers, we do feel that any growth in Northamptonshire’s warehouse sector is likely to be adversely affected by the increased competition, especially from London Gateway.

Growth will come from post-consumer sources

Northamptonshire should exploit its central location to attract much more post-consumer logistics activity such as resource recovery, recycling and remanufacturing. The central location of the county is also ideal for reverse logistics activities and the management of excess inventory.

Whilst the ability of the country to attract inbound activities will be affected by the increased competition from the ports, post-consumer activities do not benefit from the co-location of the facility with a deep-water port. As long as routes are maintained to transport containerised materials

to Felixstowe or other ports, links with major re-processors (e.g. of plastics, metals and rare earths) based in Europe and farther afield can be developed.

Similarly, the central location of Northamptonshire is ideal for siting returns management operations that take in items sent back by individual consumers. Such operations typically reconsolidate small consignments into larger loads that can be reintroduced into a forward supply chain. As such, they do not require the same high bay warehousing that is favoured for inbound operations and may offer a use for the considerable stock of low-bay facilities that exist within the county.

The role of the Royal Mail and other couriers will be pivotal in developing this market.

A new pool of entrepreneurs within our midst?

Businesses in Northamptonshire and across the region are facing long-term difficulties in recruiting sufficient high-quality staff. Many have found solutions through recruiting abroad, typically in Eastern Europe, and a sizeable migrant labour force has settled in the region. In the near term, any easing of the demand for labour might be expected to trigger the return of many of these workers to their home countries, but as time goes by, the integration of this labour force into the local community will progress to the point that many will consider the UK, and Northamptonshire in particular, as home.

Such a pool of talent has the potential to provide a new pool of logistically-aware entrepreneurs who could be at the forefront of the development of new logistics solutions, especially those aimed at facilitating resource recovery and the circular economy.

The establishment of a growth hub for commercial activities related to the circular economy would be expected to have an additional benefit in promoting social enterprise. The potential to support social enterprise through post-consumer solutions has already been demonstrated by the efforts of companies such as Goodwill Solutions in Northampton, and further growth in the third sector can be expected.

Investment in infrastructure nationally can have benefits locally

Investment in infrastructure is often identified as a key policy that governments can implement in order to stimulate labour demand and to enhance national productivity.

Setting priorities for infrastructure spending is based on a combination of factors, often including estimates of funding needs. However, determining “need” is complicated by differences in purpose, criteria, and timing. In the context of evaluating job creation plans, a further complication is whether funds are targeted to true need, and whether “need” is defined by engineering assessments, by economic measures such as unemployment, or a program’s effectiveness in leveraging private capital.

By definition, the goal of stimulus spending is to get money into the economy swiftly, but infrastructure spending is different. The reality is that large infrastructure projects typically are multiyear efforts with slow initial spending that continues over a period of time.

Using accelerated investments in the nation’s public infrastructure as a mechanism to benefit economic recovery is widely agreed to be an effective strategy. From a Northamptonshire

perspective, rapid interventions such as the Local Pinch Point Scheme provide a route to medium-term improvements in logistics performance, even if the short-term disruption may be painful.

The county should therefore support the implementation of such schemes, and actively work with the relevant agencies to identify further investments that can be rapidly implemented.

Spending advocates contend that even when the recovery from a lengthy recession is slow - as it is now - projects with extended timeframes can still contribute to the economy's recovery. The county's current position as an objector to the HS2 Bill therefore places NEP in an awkward position, since the business benefits of a release in rail capacity on the existing rail lines will not accrue if the investment in additional capacity elsewhere in the network is not made.

Business is coming home

The current trend for businesses to re-evaluate their decisions on manufacturing, outsourcing and location should be actively encouraged at both national and local level.

A business that chose to relocate its operations overseas some years ago, or who chose to outsource their operations to an overseas supplier, will not automatically return to its alma mater, or to its spiritual home. These remain difficult and careful calculations, based on many factors, and Northamptonshire has much to offer a business looking once more for a UK manufacturing base.

The pre-eminence of Northamptonshire as both a location for high-technology manufacturing and for logistics are powerful factors that can be brought together to craft a strong argument for setting up business in the county.

A Vision for the Future of Logistics in Northamptonshire

Our survey paints a picture of a logistics industry that is under severe cost pressure, facing major skills shortages, increased competition, and yet lacking the cohesive will to pull together to improve their situation.

The industry's focus on its customers is not in doubt, yet its stance appears to be reactive and short-term, with very little evidence of an appreciation of even medium-term developments. The low awareness of the planned legislation establishing the goals of the Circular Economy is a concern, since many of the logistics industry's own customers will look to them for guidance on meeting resource recovery targets. The low priorities afforded to the adoption of alternative fuels and sources of energy are also indicative of a focus on current operations, rather than on the future of the industry.

Nowhere is this short-termism more evident than the lack of collective investment in the future of the labour force. The level of engagement between the logistics industry and local schools and colleges is simply not comparable to the efforts made by our European competitors. For example, the Education and Information Centre at Rotterdam Mainport hosts over 25,000 schoolchildren every year; over 50 partnering companies offer site visits to interested groups. A target of 500 apprenticeships per annum has been laid down as part of a clearly articulated collective plan agreed by over 700 businesses, working together in an association known as Deltalinqs. This plan is itself aligned to an equally-clear vision for infrastructure development that is aligned with a long-term strategy for growth reaching out to 2030.

Rotterdam's vision aims to secure the future of some 90,000 jobs. The cooperation between national and regional government, city authorities and business that underpins Rotterdam's success should be closely studied in Northamptonshire.

The core logistics and transport sector in the county was estimated at 27,000 employees in 2012. Once industries whose primary operation is not logistics (but where logistics activities take place) are added, this figure rises to 40,000. Growth in the sector was expected to take the figure above 51,000 by 2021. A sector of such a size as this, representing as large a proportion of total employment, should be the focus of concerted activity to secure its future.

Such a focus would be completely aligned with the Northamptonshire Strategic Economic Plan (SEP) which outlines NEP's and its partners' ambitious growth strategy which will deliver over 32,000 new jobs and 37,000 new homes by 2021; increasing to 70,000 new jobs and 80,000 new homes by 2031.

The SEP provides real strategic focus on those issues that will make sure that Northamptonshire's economy goes further, faster. The Strategic Economic Plan is rightly ambitious, recognising that Northamptonshire is a strong performing economy in relative terms, has a real appetite for growth and the delivery capability to realise this ambition.

The analysis underpinning the SEP identified a series of strategic imperatives that will either accelerate or potentially inhibit growth, if not addressed, namely:

- **Innovation** – working with our business base to develop open innovation and create innovation networks within and across sectors and with recognised centres of excellence.

- **Productivity and Competitiveness** – developing the productivity and competitiveness of our SMEs; accelerating growth in our priority sectors; identifying and growing new priority sectors; developing inward investment activity; and restoring our productivity premium.
- **Population Growth** – providing the opportunity to grow the economy further, faster as this contains a significant element of inward migration, which is ensuring that the working age population is not facing serious demographic challenges.
- **Employment and Skills** – whilst enjoying excellent employment levels, Northamptonshire has lower levels of skills attainment at every level, and this is a key issue that will need to be addressed to develop our knowledge economy and attract higher value added jobs.

We continue to believe that logistics will play a major role in the Northamptonshire economy. The best way that NEP can support local logistics companies in overcoming their day-to-day challenges is to show leadership in identifying solutions to the skills shortage in Northamptonshire and to identify further improvements to infrastructure that can improve transport reliability in the medium-term.

We believe that it will do so by succeeding in four key endeavours:

- The promotion of Northamptonshire as a preferred location for manufacturing and logistics
- Accelerating the pace of investment in local infrastructure by increasing engagement with public and private funding sources
- The encouragement of entrepreneurship and social enterprise within the county
- The establishment of Northamptonshire as a growth hub for businesses involved in the transformation of the UK towards a circular economy

Delivering Growth in Northamptonshire's Logistics Sector

The vision outlined above needs to be implemented through a series of coordinated actions:

1. Establish leadership for the industry in the county

We recommend that NEP should provide the leadership for the implementation of an initiative, based on the Rotterdam model, that seeks to focus the industry on its medium to long-term priorities, beginning with infrastructure and recruitment, advancing the competitive position of the regional logistics sector.

Succeeding in this endeavour will require close alignment of the strategic priorities of individual stakeholders. Whilst the fragmented nature of the logistics industry will represent a particular challenge in this regard, the intention of developing a broader growth agenda across the various industries involved in manufacturing, logistics and the circular economy will provide more opportunities to build momentum.

A broad range of industry bodies will need to be mobilised, including *inter alia* the Northamptonshire Chamber of Commerce, the Chartered Institute of Logistics and Transport, the Chartered Institute of Procurement and Supply, and the Institute of Waste Management, as well as key local employers.

We believe that managing this diversity of stakeholders will require the appointment of an individual with significant senior-level experience in the logistics industry to lead the implementation of the

initiative. This individual will need the capacity and skill to integrate and align the long-term development activities of the stakeholders, whilst representing their collective interests at up to ministerial level.

The appointment would be broadly equivalent to the level of a non-executive director.

We further recommend that contact should be made with the Deltalinqs organisation in Rotterdam, to understand both how it has grown to become the effective lobby that it is and to understand the lessons learned along the way.

2. Integrate Logistics Industry Focus and Growth Governance

Under Northamptonshire's current growth governance arrangements, four priority strategy boards (Business and Innovation, Employment and Skills, Infrastructure and Connectivity and Housing) are tasked with overseeing the implementation of these strategic priorities. Four further sector strategy boards (High Performance Technology, Logistics, Food and Drink, Creative and Cultural) report directly to the main NEP board on their respective sector priorities:

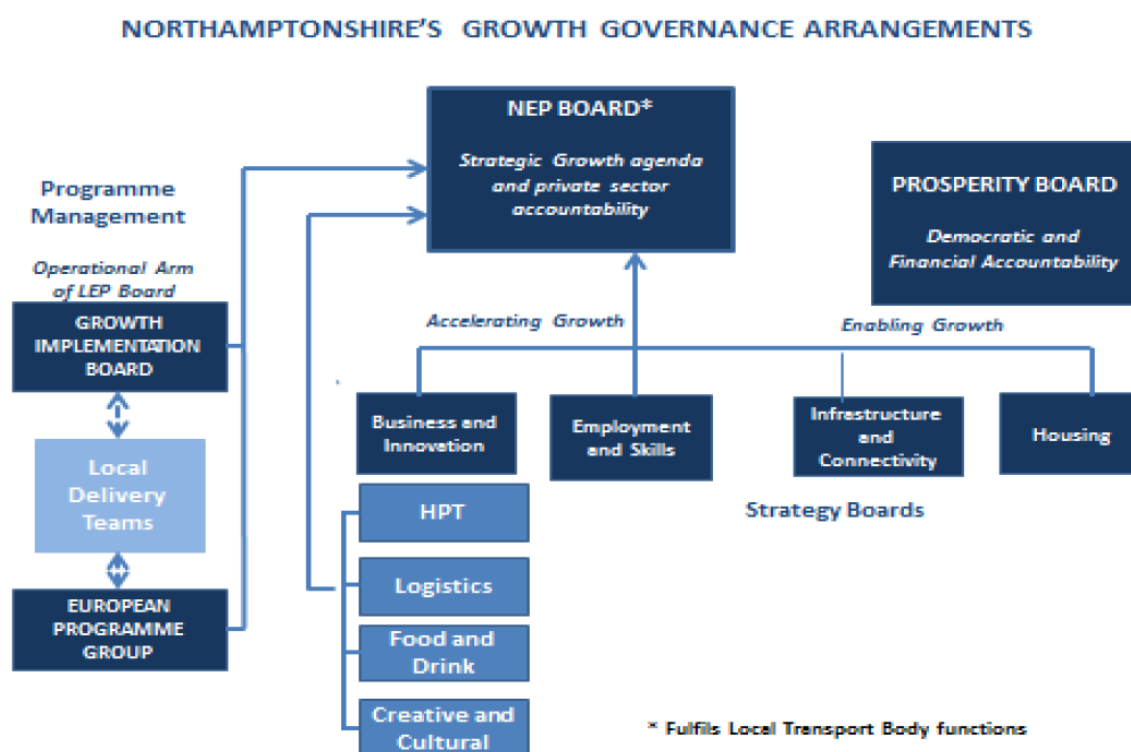


Figure 8: Current NEP Growth Governance Arrangements (NEP SEP, December 2013)

The terms of reference for the strategy boards allow for representation from “public, private, third sector and relevant specific interest groups dependant on theme”. Given the current priorities within the logistics industry, we believe that the new head of the logistics body should represent that industry's interests as a member of all four priority strategy boards.

The benefit of senior input into Business and Innovation, Employment and Skills and Infrastructure and Connectivity should be apparent from our research, however we would also note that Housing is a key factor in the availability of labour to respond to growth in the logistics sector.

The European Programme Board has the ability to invite participation from individuals to support its work programme and we believe that the sector specialist should participate in its discussions.

The participation of a sector specialist in the Growth Implementation Board is not currently provided for in the terms of reference and would therefore require co-option or amendment to the terms.

3. Increase activity in schools and colleges

Stronger engagement by the logistics industry with schools, colleges and careers advisors is needed to overcome the lack of awareness of the opportunities that logistics affords to young people.

Targeted initiatives, similar to the involvement of Knights of Old and Action Express with Job Brokerage, are more likely to prove effective if accompanied by a general programme of raising awareness of the logistics industry and its impact on the local economy through media and other publicity.

4. Support investment in infrastructure

A key role of the logistics leadership will be to make the logistics case for investment in infrastructure, thereby influencing decision-making on road, rail and other projects.

The leadership should also work with the logistics industry and the property sector to attract new potential real estate investors to the county. Support to deliver the anticipated development of key sites such as Corby, Brackmills Point, Kettering East and DIRFT 3 should be increased.

5. Integrate local, regional and national activity

The logistics leadership in Northamptonshire will be in a pivotal position, being able to lead local initiatives, support regional activity and influence national decision-making.

An example is the national initiative to promote reshoring, where Northamptonshire's logistics advantages should be promoted as part of the case for bringing manufacturing back to the UK.

6. Encourage and support entrepreneurship

Support to entrepreneurs is already a strong feature of NEP activity, however we believe that logistics should feature more strongly within small business support provision, both as an enabler of general business and as a focus for specialist start-ups.

In particular, we believe that there is considerable untapped potential for entrepreneurship within the recently-arrived logistics workforce. However, we believe that any initiative targeting this sector should be incremental to current activities and should not result in diverting resources away from existing SMEs.

7. Encourage medium-term thinking

NEP should develop an industry education programme intended to raise awareness of key issues likely to face the industry in the next 5 years.

This might take the form of a series of industry 'talks' or lectures and we suggest that the opportunities afforded by the circular economy could be an early one of these.

Concluding remarks

This study has highlighted the commonality between the key strategic themes identified in the Northamptonshire Strategic Economic Plan and the key challenges facing the logistics industry.

We believe that this commonality suggests a close alignment of the implementation and governance of the strategic themes contained within the SEP with the key priorities of the logistics sector.

If Northamptonshire is to maintain its position as the leading location within the United Kingdom in which to site logistics operations, then this common purpose must be exploited to bring the growth benefits that all parties aspire to.

The key to delivering growth in the logistics sector is strong leadership. We believe that NEP should invest in its own management capabilities to take that leadership position, drawing on the mandate of its own strategic plan to do so.

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2nd September 2014



Appendix A: Business Demographics

Just under half of all the respondents were from the logistics and distribution industry, with a further quarter employed in other operational disciplines such as manufacturing, wholesaling and retailing. The final quarter of respondents came from non-operational disciplines such as consulting and education.

The respondents included representatives from large, medium, small and micro-enterprises.

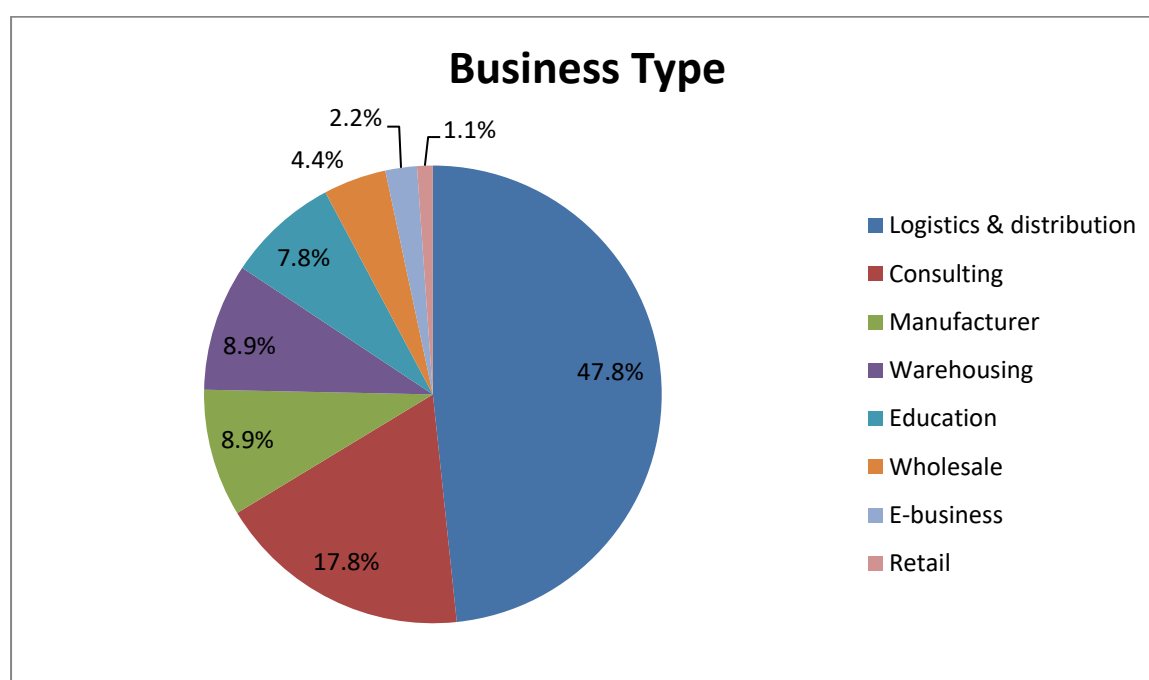


Figure A1: Business type

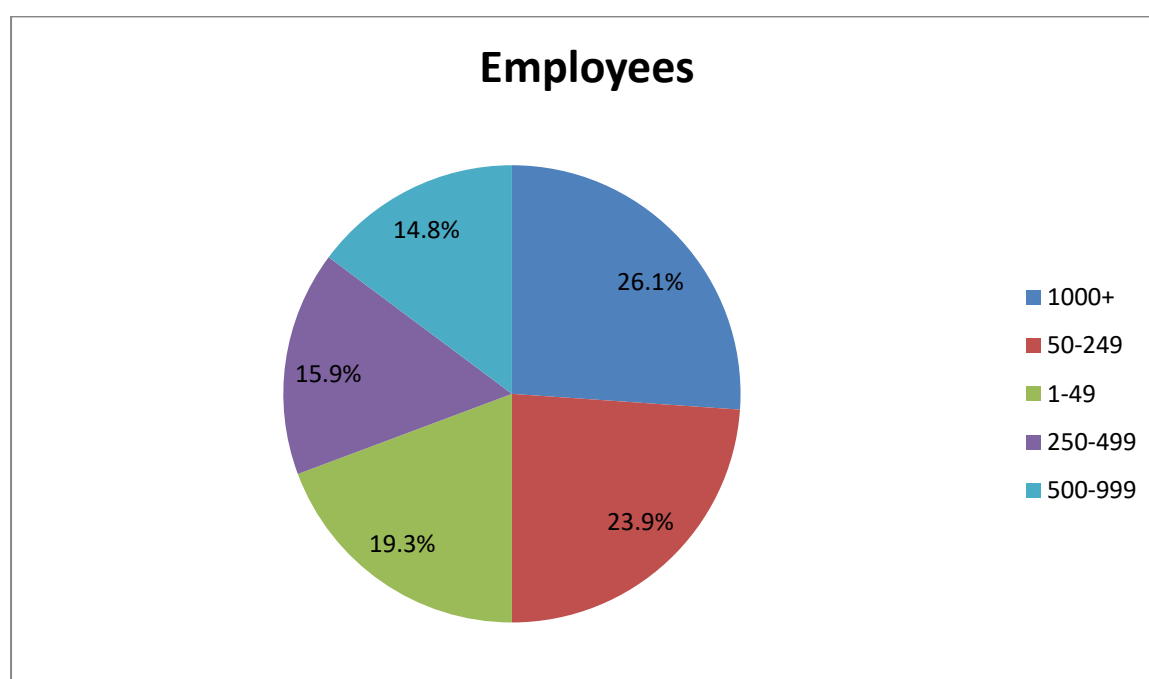


Figure A2: Business size

The majority of businesses had turnover in excess of £1m per annum. Over half of all respondents worked for national and regional companies with the balance from multinational and global entities.

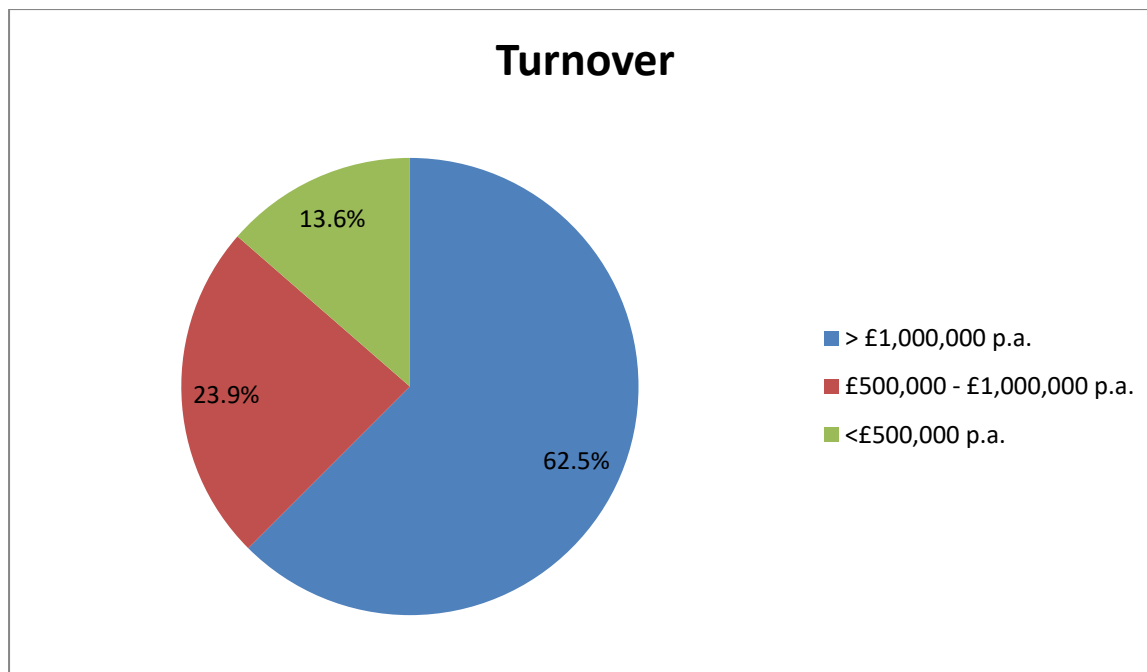


Figure A3: Turnover of responding companies

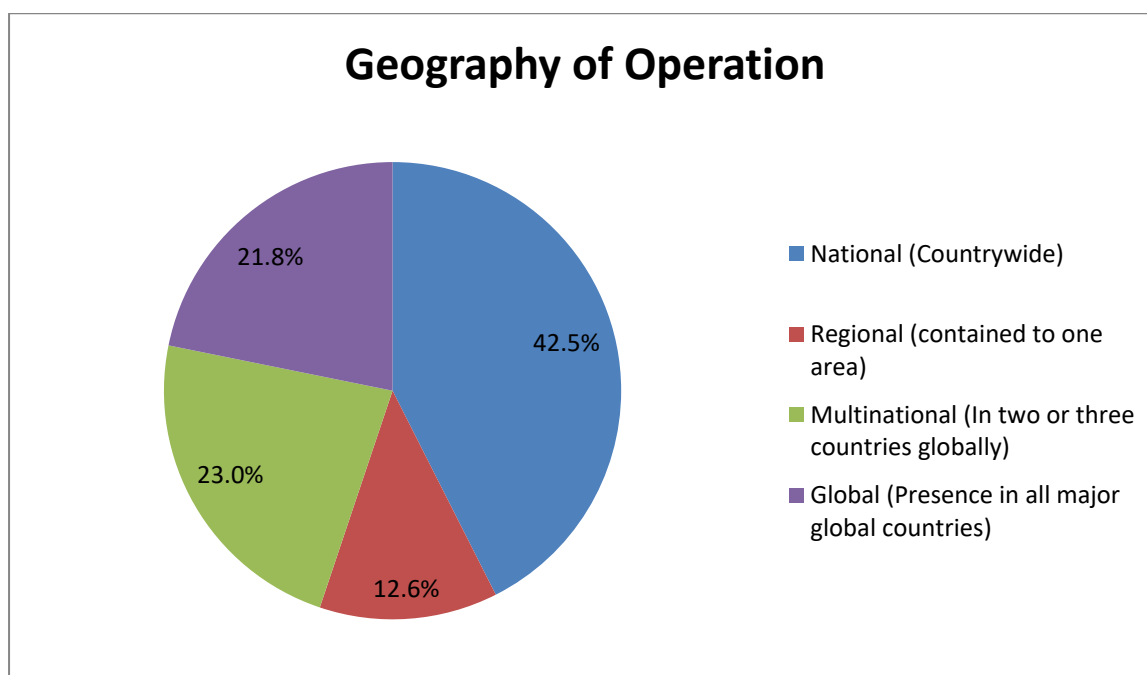


Figure A4: Business description – geography of operation

Appendix B: Questionnaire Design

Section 1: Business Demographics

1. Business type

- a) Manufacturer
- b) Warehousing
- c) E-business
- d) Logistics & distribution
- e) Wholesale
- f) Retail
- g) Consulting

2. Size

- a) 1-49
- b) 50-249
- c) 250-499
- d) 500-999
- e) 1000+

3. Turnover

- a) <£500,000 p.a.
- b) £500,000 - £1,000,000 p.a.
- c) £1,000,000 p.a.

4. Business description

- a) Regional (contained to one area)
- b) National (Countrywide)
- c) Multinational (In two or three countries globally)
- d) Global (Presence in all major global countries)

Section 2: Ranking of factors

5. Please rank the following business risks in the order that they apply to your business (1=highest risk, 10=lowest)
 - a) Business interruption and supply chain risk
 - b) Severe weather and/or flooding
 - c) Fire, explosion
 - d) Changes in legislation and regulation
 - e) Market stagnation or decline
 - f) Loss of reputation or brand value
 - g) Intensified competition
 - h) Cyber crime, IT failures
 - i) Theft, fraud, corruption
 - j) Quality deficiencies, product recalls

6. Please rank the following factors when choosing a business location (1=most important, 10=least important)
 - a) Distance to customer
 - b) Distance from supplier
 - c) Availability of local management
 - d) Availability of local staff
 - e) Availability of expert advice
 - f) Subsidies/grants
 - g) Availability of transport capacity
 - h) Stability of transport cost
 - i) Reliability of transport
 - j) Intermodal solutions

7. The Government has announced a further tranche of funding to relieve local transport “pinch points”, such as congested roundabouts and intersections. Please identify the top three locations that you feel should benefit from targeted investment.
 - a)
 - b)
 - c)

8. Which of the following would you deem to be an economic constraint within logistics?
 - a) Lacking confidence in future growth
 - b) Market uncertainty
 - c) Increased market competition
 - d) Availability of skilled labour
 - e) Network infrastructure growth
 - f) Other (free text)

9. Which of the following do you see as a logistics facility challenge?
 - a) Location to alternative transportation modes
 - b) Facility cost
 - c) Site security
 - d) Lack of development
 - e) Constrained by size
 - f) Constrained by contract length
 - g) Constrained by type
 - h) Not on a public transportation route
 - i) Other (free text)

10. When reviewing logistics location advantage, which of the following pertains to your own business?
 - a) Resource based (close to regional resources)
 - b) Import substituting (Includes cost labour, materials and taxes – all cost included with the imported finished goods)
 - c) Export platform (Considers low cost labour incentives for facility location)
 - d) Trade & distribution advantage (Main focus is being close to the customer)
 - e) None of the above
 - f) Other (free text)

11. Of the following what do you feel is a logistics network constraint?
- a) Facility location to major road networks
 - b) Traffic congestion
 - c) Location in terms of rail freight options (all ports Felixstowe/London/Southampton)
 - d) Time from inland port to warehouse back door
 - e) Location to air freight options
 - f) Cut off times for major parcel carriers and freight forwarders
 - g) Ability to have a true multi/synchromodal transport network
 - h) Fuel costs
 - i) Environment considerations
 - j) Other (free text)

Section 3: Impact of Key Trends

12. Are re-shoring trends affecting your logistics network decisions currently?
- Likert scale
13. If answered yes to Q8, what one area would your business focus upon when making the decision on where to locate your facility within Europe?
- Free text
14. How important is reverse logistics to your business?
- Likert scale
15. How do you feel reverse logistics networks could be improved upon?
- Free text
16. Have you heard of the circular economy?
- Yes or no
17. Do you feel it is important to base logistics infrastructure decisions around environmental and resource efficient metrics such as recycling and alternative fuels?

Likert scale

18. Please rank the following resource efficiency metrics according to the manner they affect your business (1 highest and 6 lowest)

- a. Fuel efficiency
- b. Drop density
- c. Vehicle fill
- d. Reverse logistics
- e. Alternative fuels (vehicle)
- f. Recycling
- g. Alternative energy (warehouse)

19. Has your business been subject to supply chain fraud in the past 12 months?

Yes or no

20. Is fraud in the supply chain a consideration for where you place logistics facilities?

Likert scale

21. If greater sharing of information occurred regionally between logistics operations would it aid in lowering logistics crime?

Likert scale

22. Do you believe that the sharing of information between logistics businesses on a central database about drivers could assist in lowering accident damage and protect brand reputation?

Likert scale

23. Has your business experienced in the last 12 months a shortage of skilled logistics workers?

Yes or no

24. Would the logistics industry benefit in your opinion from an educational pathway (e.g. apprenticeship to Degree) to attract new talent into the profession?

Likert scale

25. Do you feel women are represented strongly enough within the logistics sector?

Likert scale

26. Do you believe logistics as an industry is fully understood by potential candidates for job roles?

Likert scale

27. What is your view on the proposals for High Speed 2?

Likert scale

28. Please expand on your answer to Q24.

Free text