

OPTIMISING YOUR DISTRIBUTION NETWORK

**-STRATEGY AND DESIGN-
WHITEPAPER**

Optimising Your Distribution Network Strategy and Design

Operating a distribution facility or fulfilment centre is a major expense. Location, poor design and layout can all impact efficiency, leading to higher running costs and reduced service levels.

The rise of **e-commerce and changes** in customer buying behaviour are causing manufacturers, distributors and retailers to question their future plans.

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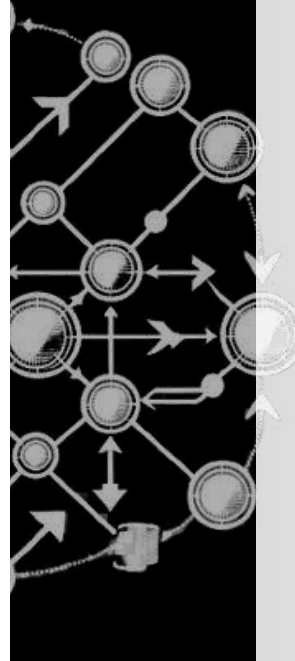
WHAT IS A DISTRIBUTION NETWORK STRATEGY?

A strategy is a plan to determine the most economical way to receive, store, and despatch goods while, achieving the desired level of customer service. The aim is to maximise profits and optimise service levels.

There are many considerations:

- How many distribution centres do I need? One or more?
- Where should they be located?
- Which products should be stocked at each and in what quantity?
- Which customers should be serviced from each?
- What equipment, staff and technology will I need?
- What are the required and achievable service levels now and in the future?
- Which delivery methods should be used?

The best distribution network for your business is one that will satisfy your customers, provide flexibility and minimise operating costs. This guide will help you understand various distribution network designs and how to find one that suits your own business model.



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LOGISTICS DESIGN IS ALL ABOUT THE TRADE-OFF

Additional distribution centres can allow goods to be located closer to customers, reducing last-mile transport costs.

However, **more sites** mean extra management and fixed expenditure, potential duplication of inventory and higher costs on inbound transport and replenishment.

The **trade-off is unique to each business**, driven by factors such as order size, product cube, value density, lead times, etc.

The **strategy should consider** potential future developments, as well as providing the best solution from day one.

This may include varying sales growth by geography, changes in customer type or route to market mix, changes in service level offering and expansion of the SKU range.

The future is unpredictable, so retaining some flexibility is important.

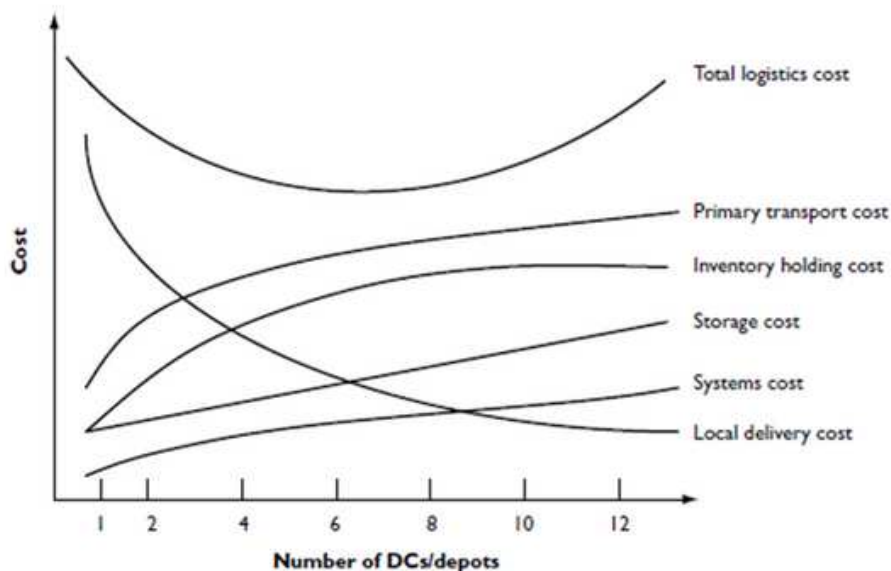


Figure 1 Source: Rushton et al., 'The Handbook of Logistics and Distribution Management,' 5th ed., Kogan Page

You may encounter challenges when there are current commitments, e.g. long leases on facilities.

Making any change to **your network** without due consideration may result in unnecessary operating costs and a reduction in customer service levels.

SUSTAINABILITY AND ESG CONSIDERATIONS

Environmental, Social, and Governance (ESG) considerations are also increasingly playing a role in the development of logistic strategies.

One example is the desire to operate electric vehicles which may influence network infrastructure due to the available size and range of these vehicles.

A new distribution centre may offer the opportunity for improved energy efficiency and the chance to generate electricity on-site through solar panels and wind turbines.

3 WHY DO DISTRIBUTION NETWORKS VARY SO MUCH?

Even the largest global distributors work differently.

Walmart divides its distribution network into specific categories. For example, it has regional distribution centres for food, fashion and more. This ensures that each distribution centre is focused on one product area and is therefore perfectly designed to meet the needs of delivering that product quickly and at the lowest cost.

Amazon has 1,215 distribution facilities in 21 countries. Amazon primarily breaks its distribution network down into prime hubs, fulfilment centres, inbound and outbound sortation centres and delivery stations.



REGIONAL DISTRIBUTION CENTRES

Regional Distribution Centres (RDCs) stock fast-moving ambient lines; chilled lines are generally on a 'stockless' basis, i.e. just in time from suppliers and cross-docked through RDCs.

These centres will receive typically full-load deliveries from suppliers – only the larger suppliers, or those with bulkier goods will have sufficient volume to send full loads into every RDC.

A supermarket chain might have eight to ten RDCs to cover the UK, assembling typically full loads across multiple suppliers' products for delivery into its store. This is likely to be cost-optimal, it also limits sites to manageable size and de-risks the network.

Chilled or fresh produce may be accommodated as separate chambers in a 'composite' site alongside ambient products, or may have their own separate RDCs.



The ambient distribution centres of one of the main chain of supermarkets in the UK

SLOW-MOVING / SPECIALIST CENTRES

These stock a broad range of slower-moving or smaller products. They typically trunk full loads to the RDCs for cross-docking and onward delivery, in combination with the RDC-stocked products.

This allows a **single stocking point** for these smaller or specialised/high-value-density products, reducing inventory and allowing for rational inbound and outbound flows.

Specialist national distribution centres are common for apparel or general merchandise (electronics, etc.). This also allows for automation as all the similar activity is concentrated in one place.

Similar **fast/slow networks** are common amongst wholesalers and drinks suppliers, who often have smaller consignment sizes and therefore need to base fleets of smaller vehicles at **regional distribution centres** to reduce 'stem' mileage to the customers and maximise deliveries per route.

Again, the **'tail'** of the product range will usually be re-supplied to RDCs from a single point.



Slow-moving ambient distribution centres of the second most-biggest chain of supermarkets in the UK.



SINGLE-SITE DISTRIBUTION MODEL

In contrast, **fashion brands** may operate a **single distribution centre for the UK**, or even for all of Europe. These businesses carry an extremely high variety of merchandise (100,000+ SKUs is common). Tight control over inventory is necessary as there is high SKU churn (lots of new product introductions per season).

The **single site model** allows consolidated inbound shipments (typically in shipping containers), a single stocking point across all routes to market ('omnichannel'), keeping options open in response to demand.

With many outbound deliveries being via parcel courier, these companies are taking advantage of the downstream networks built by DPD, Evri, FedEx, etc. rather than building their own. The large scale of these sites lends itself to automation e.g. shuttle systems and autonomous mobile robots (AMRs).

FMCG brands also often operate from one or a small number of sites per market. A **single site allows** return legs to be used to collect from the factories at a low cost and consolidate production volumes in one place for storage and onward delivery. Despatches are often full loads and the customer receives a single delivery from the supplier.

The **FMCG supplier** benefits from economies of scale and the opportunity to automate. Lower volume FMCG suppliers will often be found within shared-user sites, operated by third-party logistics companies.



H&M Distribution Centre



FMCG Distribution Centre

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THE 5-STEP PROCESS TO A
LOGISTICS NETWORK SOLUTION

STEP 1:

UNDERSTAND YOUR 'TODAY' SITUATION

Before you can consider making improvements you have to understand and document how everything works now.

Recent shifts in your business, such as sales volume, customer base and future market expansion may be causing you to rethink your plans. Using reliable historical data, build up a database of existing warehouse and transport material flows and look to understand everything that happens in the current operation and why.

You may be using some **counter-intuitive practices** for a good reason, e.g. to meet a specific customer requirement. Document your constraints. These may be financial budgets, production and/or storage limits, space expansion potential or labour availability. This determines your **baseline**.

STEP 2:

APPLY THE BUSINESS GOALS TO CREATE A PLANNING BASE

Once the baseline is well understood, future business projections should be applied to the data-set to arrive at a 'planning base.' **Be clear on your goals.**

The **planning base** is a mixture of verified information and data that represents the best estimate of what the future looks like year by year – material flows, order profiles, stock profiles, outbound deliveries, etc.

This is a time-consuming task in the **network design process**. A baseline model is typically built on data from the previous 12 months of operations. It should accurately reflect the current operation and capability of the distribution network. In high-growth businesses, multiple versions of the planning base may be required to consider high/medium/low scenarios.

STEP 3:

CREATE DISTRIBUTION NETWORK SCENARIOS

Geographical modelling can be used to define a 'centre of gravity' location that corresponds to the lowest outbound transport cost location for a distribution centre. It can also answer questions such as "if we had x distribution centres, where should we locate them?"

A **consultant or other modelling expert** will use a suitable software package to map the customer locations and movements and find optimal DC locations based on the minimisation of transport mileage and/or cost.

Transport costs are only part of the picture - the trade-off against other factors must also be considered – for example, locations away from the theoretical optimum may have lower rental costs, or better labour availability.

The function of sites should be considered – e.g. fully stocked, partially stocked, stockless out-base. **Inventory modelling** techniques can be used to support this. The output of this phase should be two to five possible **network scenarios** that require further analysis and cost modelling.



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THE 5-STEP PROCESS TO A LOGISTICS NETWORK SOLUTION

STEP 4:

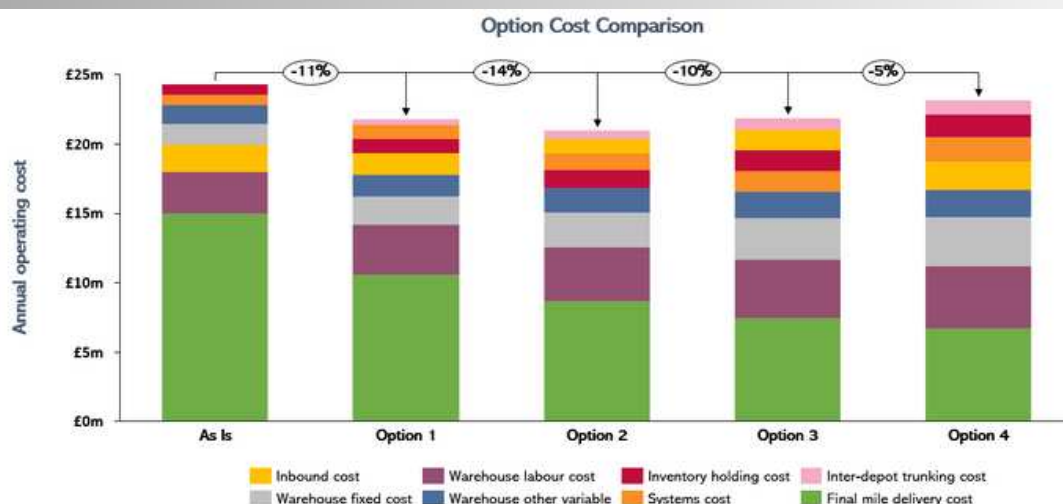
MODEL THE COSTS AND BENEFITS OF EACH OPTION

Cost modelling will be required to take into account inbound costs, fixed and variable warehouse costs, inter-site movements, customer delivery costs and the cost of holding inventory.

A flexible **activity-based cost model** should be created, that considers all of these costs at an appropriate level of detail. It should allow for the configuration of different network and volume scenarios. Your complexity in each cost area may vary.

Semi-bespoke models, based on well-established costing methodologies, generally give better insights than 'off-the-shelf' software packages. **Outbound delivery** costs may require the use of routing and scheduling software if an own fleet model is considered. Sensitivity analysis should be conducted on the most critical variables to understand the impact on costs and service levels.

There are also costs involved in any transition. These could include modification or expansion costs for **existing facilities, relocation expenses and HR costs**.



The modelling process may be iterative as possibilities and constraints are revealed from the initial results.

STEP 5:

DEVELOP THE SOLUTION TO IMPLEMENTATION

Once the options are fully understood, alongside **the associated costs, benefits and other pros and cons** (e.g. service level impacts, systems implications, etc.), these should be reviewed to determine the preferred option. **You may have constraints that mean you cannot immediately move to the 'optimal' solution** – for example existing sites with long leases, fleet assets, third-party contracts, inflexible systems, etc. In that case, you need to look for the optimal solution that is possible while respecting these constraints. **A roadmap of medium to long-term decision** points helps to move closer toward the optimal solution when circumstances allow.

Once the **preferred solution** is understood, timelines, sequencing, risks and dependencies can be considered in the compilation of an implementation plan. **Implementation** is likely to include further project phases, such as detailed warehouse operational design, tenders for third-party logistics services and systems projects.

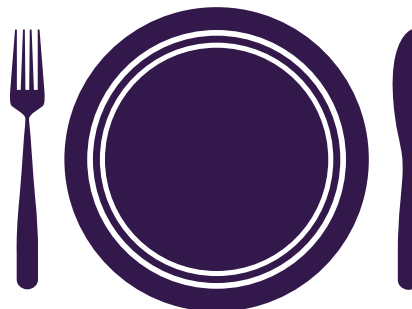
Following these five steps will help you identify the best distribution strategy for your business, minimise operating costs, maximise customer service and improve flexibility to adjust to changes in business strategy and growth. **Your network strategy** is a key step in ensuring the business remains agile to respond to change and disruption.

Optimising the distribution network by reducing site service levels might seem like a straightforward way to cut costs or improve efficiency but it is essential to consider the broader impacts on the business. Specifically, there is a risk that such actions could lose sales and the relationship with customers, which are critical for long-term success.

CATERING WHOLESALER (UK NATIONAL DISTRIBUTION)

SCCG conducted a detailed **review of the existing logistics network capacity and future requirements**. A range of network options were explored and costed.

Based on business growth forecasts, SCCG identified the **optimal location** for an additional site and remapped customer allocations to optimise the network within site capacity constraints.



MAJOR RETAILER (BENELUX AND UK)



SCCG evaluated alternative **distribution models** for this major retailer of products for the home, considering changes in the market and the target customer proposition.

This included **understanding the required operating model** and the likely effect on customer service and sales, super-hub locations and their sizing, resourcing, operating costs, options around direct-to-customer fulfilment and the ongoing role and opportunities for the existing warehouse.

GLOBAL TOY COMPANY (PAN EUROPEAN DISTRIBUTION)

The client approached SCCG to define the **optimal network for their presence in Europe**, to provide a sound and sustainable logistics platform to support its growth.

A range of network options (**single and multiple warehouse**) were modelled and a recommendation made, considering multiple location factors (transport costs, achievable service levels, labour availability and cost, space availability and cost, ease of doing business, etc.)



PUB COMPANY (UK NATIONAL DISTRIBUTION)



Following an acquisition, SCCG were engaged to **conduct a network review** for drinks delivery, modelling deliveries to circa 5,000 pubs and determining synergies between existing and newly acquired estates, as well as the optimal mix of own-fleet and outsourced transport resources.

IMPROVE YOUR LOGISTICS OPERATIONS BY WORKING WITH **SCCG**



About Us

We are **The Supply Chain Consulting Group (SCCG)**, a well-established logistics consulting firm with a great reputation for helping companies to meet their business goals through effective logistics strategy and design.

With over **700 completed projects** in more than **50 countries**, our experienced consultants are constantly hands-on with every project, ensuring operational efficiency to innovative technological integrations.



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- 3PL Outsourcing and Tender Management
- Transport Modelling and Route to Market Strategy



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