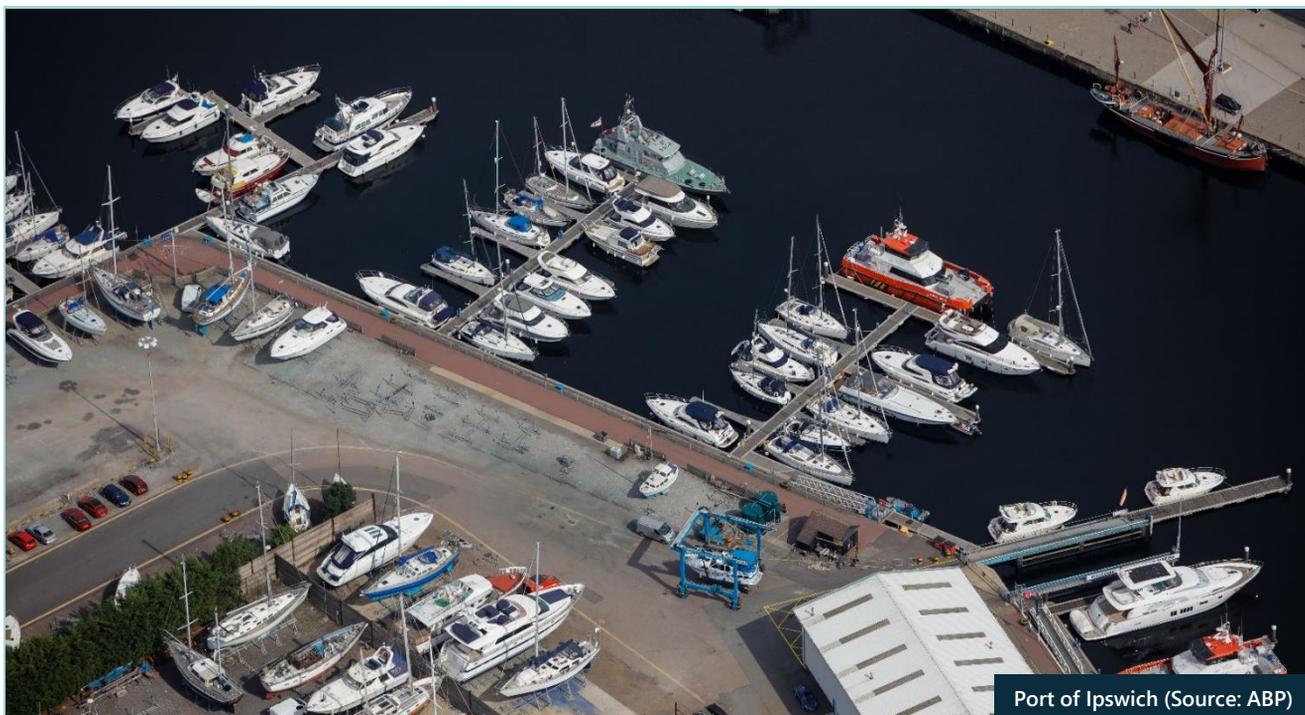


PORT MASTERPLANNING

Planning for the Future





This White Paper is part of Port Futures, a thought leadership platform for British Ports Association (BPA) members and the wider industry. The programme addresses key issues for ports, including technology, infrastructure and skills, as well as opportunities for and challenges to British ports that these issues present.

ABPmer has extensive experience helping develop port masterplans for Associated British Ports' facilities across the UK, many akin to the diverse range of ports within the BPA's membership and throughout the UK.

What is port masterplanning?

Port masterplanning deals directly with two of the most challenging issues facing the ports industry:

1. Understanding the nature of the very rapid commercial, environmental, technical and social changes that are going to hit economies over the coming decades.
2. Responding appropriately to such changes.

For the ports industry, these present big challenges and exciting opportunities. Successful ports will be those which make the most coherent infrastructure and property investment.

A masterplan outlines how a port intends to respond to change. It begins with what is happening at the port now, and why. It then explains what needs to happen in future. Finally, it sets out how the port intends to get there.

At its core, a port masterplan will nearly always include a map, setting out the physical extent of plans for change. The map should result from a detailed process of strategic thinking that delivers the best possible contribution to commercial growth, the local economy, and the local environment whilst working with a practical understanding of the risks and constraints facing the port. At the same time, it should also deliver a set of investments over the short, medium and long term.

By their nature, ports are at the interface of land and sea, making them unique places to masterplan.

Successful port masterplanning is based on a robust appraisal of factors that may impact current and future operations. For this analysis to unlock insights, the masterplan is likely to see the port in its wider economic, social, environmental and geographic context. It

therefore requires a range of competencies including an understanding of economics (shipping and transportation), finance, navigation, environmental policy, engineering, urban planning, transport, connectivity and wider social aspects, as well as the potential impacts of climate change.

Defining the most appropriate time horizon for port masterplans is difficult. The timeframe should be long enough to cover the emergence of long-term issues, but not so long that the sense of urgency is lost. A masterplan horizon of 20-25 years is usually sensible. Importantly, the analysis underpinning the masterplan should be regularly reviewed as part of ongoing monitoring and adaptive management.

The nature of individual masterplans may differ quite considerably, reflecting (at least in part) a difference in the primary audience. Most will start as internal documents which are more akin to long-term plans. These may then be translated into public high-level documents which are publicised in order to share a vision with key local stakeholders and neighbours.

It should be noted that a masterplan is not an application for planning permission, and does not constitute approval for any proposal.

However, it will assist in informing the consideration of future projects and planning applications. Following the development of a masterplan, detailed designs may be developed for certain aspects of the plan, in advance of consent application. Some aspects of the plan may be consentable under a port's permitted development rights although projects with a marine element (e.g. capital dredge, jetty construction) will require a Marine Licence from the Marine Management Organisation (in England) Natural Resources Wales, Marine Scotland or in Northern Ireland from the Department of Agriculture, Environment and Rural Affairs. Depending on the scale and location of the project, an Environmental Statement prepared under the EIA Directive and Regulations may be required, as well as information to enable decision-makers to carry out supporting assessments (for example, under the Habitat Regulations).

Who should undertake a masterplan?

The existing Department for Transport (DfT) guidance to produce port masterplans states that all 'major' ports in England (defined as those currently handling more than 1 million tonnes per



Green Port Hull conceptual design (Source: Associated British Ports and Siemens)



Port of Barrow (Source: ABP)

annum) will find advantage in producing masterplans. Smaller ports may also find benefit from completing the process of strategic review that a masterplan demands. For instance, ABP is in the process of finalising a masterplan for the Port of Lowestoft which handles around 30,000 tonnes of cargo per year. The masterplanning process has been useful to ABP by informing understanding of potential demand arising from the offshore energy sector over the next two decades. In particular, the masterplan has considered potential berthing and landside space requirements at the port, thereby helping to determine optimal berthing and port land future use.

The UK has over 450 statutory harbour authorities (of varying size) which have a duty to manage and maintain their harbour. Typically, this also includes a mandate to maximise the commercial potential of the port and masterplanning is likely to be useful in achieving this. Private and Trust Ports tend to engage more with masterplanning than Municipal Ports who are more often included in wider local strategies. However, a specific port masterplan is just as valuable for Municipal Ports, as it is for Private and Trust Ports.

Importantly, there is no requirement for a port to produce a masterplan and it is for the port to determine its legal obligations to do so. The status of a masterplan is therefore non-statutory.

The BPA is keen that the DfT refreshes its guidance (as has been recently pledged in the Department's Maritime 2050 Strategy) and is happy to take the lead in the update process.

The BPA would also like to work with the devolved administrations to create guidance around the rest of the UK. They would like to see this guidance understood and accepted by other parts of government so port priorities can be supported and complement local and regional strategies produced by local authorities and sub-regional bodies.

Why is port masterplanning important?

Masterplanning is important for a number of reasons. The three main reasons are summarised below.

1. Masterplanning promotes longer-term strategic thinking; identifying opportunities and threats which are typically distinct from those considered in shorter term business planning cycles

The relative stability of the competitive trading environment of the past few decades is increasingly being replaced with uncertainty. This is being driven by pronounced changes in commercial, end customer, technological, political and environmental factors creating

new risks (as well as opportunities) across multiple trades and business sectors. For example, the UK has recently become the first major economy to pass laws to end its contribution to global warming by 2050 and this commitment to 'net zero' has potentially far-reaching implications for port volumes (and therefore infrastructure and landside space requirements).

The prospective changes in port volumes created by these shifts are layered on top of structural changes in freight markets. These have recently been highlighted by the National Infrastructure Commission which states that 'the freight system is at a crossroads, on the cusp of major technological change. Significant advances towards clean fuels, data availability, automation, and artificial intelligence could all rapidly change the costs and the by-products of freight.' A robust masterplanning process is essential for helping to identify the potential implications of such changes, both in terms of revenue streams for the port and the appropriate spatial responses. Indeed, high quality planning is crucial given the typical combination of high cost, long design life and relative inflexibility of port infrastructure investment.

2. Masterplanning can help determine optimal use and configuration of available land

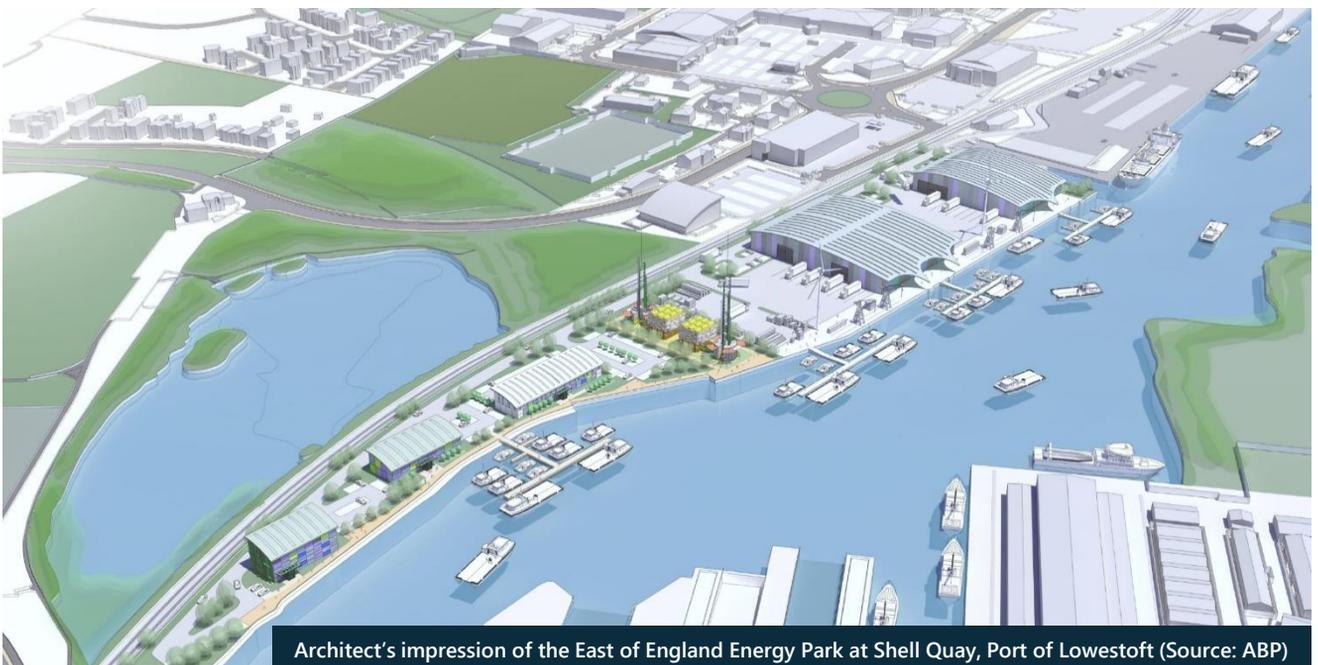
Many ports are not optimally configured. Masterplanning can help identify appropriate responses. For instance, at the Port of Barry,

Associated British Ports (ABP) had a large site with no immediate short to medium term port use. ABP's response was to develop a solar farm. This brings a useful return and green energy for ABP, its port tenants' operations and the National Grid. This site may be subsequently developed for other port uses in future.

In some cases, development aspirations may be impeded by decisions that the port itself has made in the past. For instance, many ports have previously sold off land for non-port use (in particular residential developments), with the port subsequently finding itself with neighbours unhappy about noise, dust and light pollution. Similarly, infrastructure development to capture an immediate opportunity may inhibit future options to extract longer-term value from the site. Such decisions have the potential to leave an unwanted legacy which could have been avoided with more astute long-term planning.

3. Masterplanning has the potential to help align the ports interests with those of stakeholders

Many ports encounter challenges in expanding their estates due to a wide range of environmental, social and physical factors. A masterplan may help alleviate these difficulties through publicising a port's aspirations, potentially enabling them to be taken into consideration in or aligned with regional and local plans produced by local councils.



Architect's impression of the East of England Energy Park at Shell Quay, Port of Lowestoft (Source: ABP)



Newport Docks (Source: ABP)

How is port masterplanning undertaken?

Masterplans produced for UK ports typically follow the 'Guidance on the Preparation of Port Masterplans' set out by DfT in 2008, (even though technically this only covers English and Welsh ports). However, other useful guides exist, notably that produced by the World Association for Waterborne Transport Infrastructure (PIANC) for the development of existing ports (published in 2014) and for those on greenfield sites (published in 2019). The guidance for existing ports is likely to be of most relevance to UK ports since in almost all instances, suitable estuarine and coastal locations for port construction have already been developed.

Trade forecasts are critical for detailed masterplanning, and many ports rely on detailed cargo forecasts based on analysis by commodity of historic trends.

A good port masterplan seeks to map out the investments needed to ensure the port prospers in the future. Some ports have used masterplanning techniques which help deal with future uncertainties.

Traditional model-based forecasts are predicated – with varying degrees of sophistication – on an underlying assumption that tomorrow will be broadly similar to today, and that the relationships between variables that have been observable historically will play

out into the future. Frequently, this is a reasonable assumption and these modelling approaches usually work. But sometimes such forecasts fail when they are needed the most; in anticipating major shifts in the business environment. Masterplans based on these faulty forecasts are likely to be useless.

Scenario planning is the method that many leading organisations have chosen to help deal with future uncertainty, and this approach has also been adopted by some ports in the UK and internationally. Scenario planning was a process developed during the 1970s and 80s by Shell, and widely adopted in the years later across the corporate and Government sector.

Scenarios developed are typically stories about the future. They are intended to be plausible but are not intended to be predictions. They include both qualitative and quantitative elements, so that they do not exclude ideas that cannot be measured. They are intended to help creative thinking about the uncertain aspects of the future that will have the biggest impacts, to challenge innate assumptions made by managers, and help improve understanding of the relationships and drivers that will impact ports. The approach can be used to build masterplanning responses. In particular, the approach helps identify the 'no regrets' decisions around investments that are effective in a wide range of futures, and understand which choices are more dependent on a more fragile set of assumptions.

Whilst there is no set way in which masterplanning is undertaken, masterplans tend to cover a similar range of topic areas. These are set out in Table 1.

Masterplans must avoid being rigid and inflexible. Methods used and questions addressed will need to respond to local circumstances – but there are likely to be some similarities in content.

Table 1. Potential masterplan content

PART 1: OBJECTIVES AND APPROACH	
Introduction	Objectives and approach. Typically sets out a vision for the port and the strategic outcomes which are sought.
PART 2: UNDERSTANDING THE PORT	
The Port today	Usually includes: <ul style="list-style-type: none"> • A spatial plan describing existing land uses and associated areas calculated in a GIS • An appraisal of asset condition and planned/required infrastructure spend over the lifetime of the plan • A summary of operational characteristics and a review of operational efficiency • A financial profile of the port
Responsibilities, statutory duties and management	Defines the legal responsibility of the port, as defined in national and local legislation. This must include the geographic boundaries of the Statutory Harbour Authority (SHA) and any other applicable boundaries, for example, Competent Harbour Authority (CHA).
Site safety, security and access control	Summarises key safety and maritime security issues of relevance to the masterplan, including both marine and inland access.
PART 3: OPPORTUNITIES AND CHALLENGES	
Future trends and demand forecast	Looks at detailed demand forecasts for key cargoes handled at the port and considers how this may translate into future vessel berthing and landside space requirements. Capacity analysis is a key element of this, looking at the ability of existing port infrastructure (especially locks, berths and storage areas) to accommodate projected future demand.
Vessel access	Usually includes consideration of: <ul style="list-style-type: none"> • Navigation channels and siltation • Current dredging operations • Potential future dredging operations • Disposal of dredged material
Transport	Analysis of the transport network within the port's hinterland, including identification of known bottlenecks and restrictions.
Environment	Appraisal of key environmental themes which could impede future development: <ul style="list-style-type: none"> • Presence of designated nature conservation areas • Existing issues with water quality and marine sediment/ land contamination • Noise • Flood risk – including identification of areas particularly prone to flooding within the port, as well as planned flood defence improvements • Air quality (including whether the port is located in an Air Quality Management Areas)
Policy	Consideration of relevant local, regional and national policy and strategy. At the national scale, this includes the National Policy Statement for Ports (NPSfP), DfT Maritime 2050 Strategy, DfT Port Connectivity Strategy and Marine Plans. Local Plans are also typically in place which may identify (amongst other things) plans for city/town regeneration which could be relevant to the port masterplan.
PART 4: PLANS FOR CHANGE	
Ambitions	Outlines/delineates strategic spatial plans and land use designations across all areas of the port estate, for all time horizons and future growth scenarios under consideration. A key element is the quantification of future land area requirements.
PART 5: CONSULTATION	
	This may involve publication of full draft or selected extracts for engagement with key stakeholders (such as major customers, local communities and councils).
PART 6: ACTIONS & IMPLEMENTATION	
Project plan	Typically includes estimated timing and/or phasing of development as well as infrastructure requirements.



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