Socio-Economic Impact Assessment of Portsmouth Naval Base (2012)

Prepared for:

The Partnership for Urban South Hampshire and

Solent Local Enterprise Partnership

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Acknowledgements

This document has been produced for the Solent Local Enterprise Partnership (LEP) and the Partnership for Urban South Hampshire, by Portsmouth University's Centre for Economic Analysis and Policy.

The work has been overseen by a project team led by Anne-Marie Mountifield and included Richard Jones and Gloria Ighodaro. The authors also wish to thank all those who have provided information, support and guidance during the production of this document; without their help completion of the document would not have been possible.

Any errors or omissions are the sole responsibility of the authors at the Centre for Economic Analysis and Policy.

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Executive Summary

This summary contains the main highlights of a study of the socio-economic impact assessment of Portsmouth Naval Base.

Purpose and methodology

The aim of the study is to provide a socio-economic impact assessment of the Portsmouth Naval Base on the Solent Local Enterprise Partnership (LEP) area. A similar analysis was last undertaken in 2007 but during the intervening years, the economic circumstances have changed markedly. Most areas of UK government expenditure have come under pressure to rebalance their spending as part of the austerity programme and the Royal Navy is no exception. It is this substantial rebalancing which merits a fresh examination of the socio-economic significance of the base.

The report presents a baseline measure of the economic impact (both direct and indirect) of the Portsmouth Naval Base on the LEP area in terms of both income and employment generated. Using this as a yardstick, the study then examines three distinct scenarios arising from the contraction of the Senior Service. These are ranked in terms of the potential impact on income and employment. It is, however, important to appreciate that the scenarios are not an attempt to predict policy decisions.

The qualitative aspect of research in this study incorporates: a review of impact analyses, a survey of recent defence policy and an overview of the operations of BAE Systems (BAE). The underpinning assumptions and tools of analysis to be used in the study are also set out. The remainder of the work consists largely of quantitative assessment. This, using data provided by BAE and the Naval Base Commodore's Office, begins by calculating the volume of employment and the value of primary expenditure generated by the activities of the Naval Base. Expenditures retained in the Solent LEP economy can thus be identified.

The outcomes from the primary quantitative analysis are used for the input side of the input-output model. The interaction of the input data with the model's structural form produces output data for the indirect and induced effects of the primary spending. These combine to give estimates of 'downstream' income, output and employment for each industry sector within the local economy. This underscores the importance of the Base to sectors seemingly divorced from it. The analysis provides a baseline of the economic impact of the Base. In-depth research

is used in order to arrive at realistic underpinning assumptions for any change in activity at the Naval Base. The baseline primary quantitative analysis is then adjusted, in line with the assumptions. By comparing the outcomes of the reduction or expansion scenarios with the baseline, the estimated impact of change is calculated.

The baseline

The combination of primary output and employment at the Naval Base, together with the downstream expenditure and the jobs it supports, provides the baseline against which change can be subsequently measured. Table E1 shows the baseline position of Portsmouth Naval Base (including the subsequent multiplier effects). ***Overall it generates output of £1.68bn and supports both directly and indirectly 19,775 FTE jobs. These figures equate to 3.5 per cent of LEP area output and 4.1 per cent of all FTE jobs. The base is important to manufacturing, supporting nearly 7 per cent of all such employment.***

Table E1: Baseline impact of Portsmouth Naval Base

Sector	Direct output £million	Direct Employment	D'stream * output £million	D'stream* employment	Total output £million	PNB FTE employment
Primary products	-	-	3.2	50	3.2	50
Manufacturing	259.3	2,675	154.3	1,075	413.6	3,750
Construction	49.4	425	65.2	550	114.6	975
Retail & wholesale	5.2	75	52.7	800	57.8	875
Hotel and catering	5.4	75	30.4	475	35.8	575
Transport telecom and vehicle repairs	68.5	625	85.8	825	154.3	1,450
Financial and business services	109.4	2,525	237.2	2,600	346.6	5,150
Public sector	434.3	5,150	63.5	1,100	497.8	6,250
Cultural and other services	27.3	325	30.7	400	58.1	725
Total	958.7	11,900	723.1	7,875	1,681.8	19,775
Output and employment multipliers					1.75	1.66

Note: All output figures are rounded to the nearest £100,000 and all employment figures are rounded to the nearest 25
*D'stream = downstream

The other key statistics are the output and employment multipliers (presented in final row of the table). These show the ratio between direct output and employment and total output and employment. ***In the case of Portsmouth Naval Base every £1m directly generated by the Base stimulates another £750,000 of spending in other sectors in the LEP economy. In the case of employment for every 100 FTE jobs at the naval base the resultant downstream spending stimulates another 66 jobs elsewhere in the LEP area.***

Scenarios

The three "what-ifs" used to estimate change in output and employment from the baseline position are:

Scenario 1: In this situation shipbuilding continues at Portsmouth at or around current levels and aircraft carriers, destroyers and frigates are all base-ported at Portsmouth. The rationale for this is that BAE would concentrate their shipbuilding and support activities at a single site (Portsmouth). As BAE will build and provide through life support for new classes of surface warships there are potential economies of scale by bringing all the work to a single site.

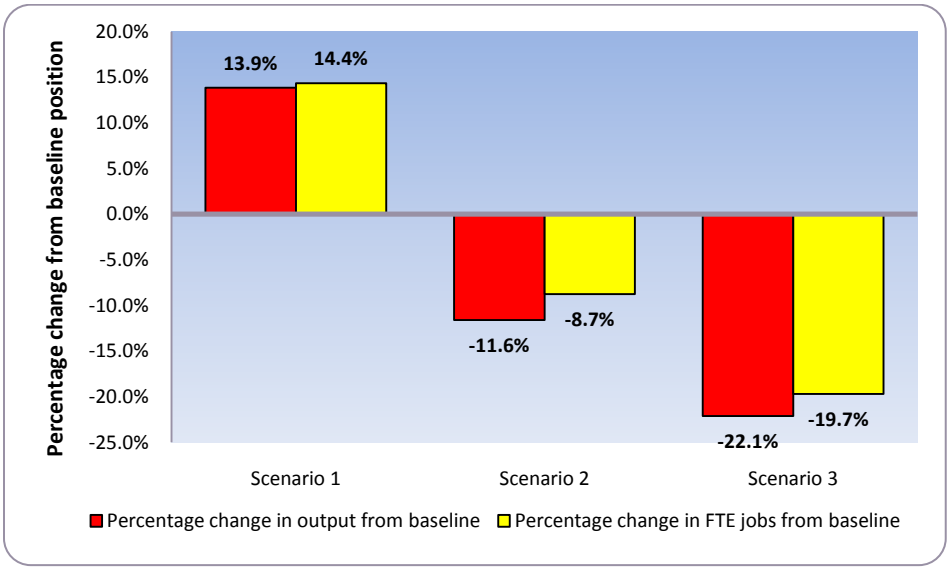
Scenario 2: In this case shipbuilding at Portsmouth ceases, aircraft carriers, destroyers and frigates are base-ported and carry out all deep maintenance at Portsmouth. The rationale is that BAE concentrate their two maritime businesses areas of shipbuilding and Maritime Services at two separate centres of excellence (the Clyde and Portsmouth).

Scenario 3: In this instance the reduction in shipbuilding activity at Portsmouth is not offset by additional vessels moving to Portsmouth or by BAE increasing the level of deep maintenance at the base.

The outcomes

Figure A1 shows, in percentage terms, the outcomes of all of these three scenarios against the baseline position. It is evident that Scenario 1 represents a net gain in output and employment, whilst both Scenarios 2 and 3 constitute a net reduction.

Figure A1: Proportional change in output and employment from the baseline position



The findings of the report clearly highlight the importance of the Portsmouth Naval Base to the LEP local economy. ***The activities within the Base, in conjunction with downstream multiplier effects through the defence supply chain and household expenditures, are estimated to produce more than £1.68bn of economic output. For specific sectors it is particularly important, supporting almost 70 per cent of shipbuilding jobs, 27 per cent in Facilities management and 14 per cent of Public administration and defence jobs.***

The base itself provides employment for an estimated 11,900 people, 60 per cent of whom are civilian employees working for a raft of defence dependant companies and directly for the MoD. Of these it is estimated that almost 77 per cent live within the LEP area. There are also a significant number of jobs associated with other defence companies and local Royal Naval and other MoD establishments. On the basis of the assumptions embedded in the scenarios, the outcomes range from a major expansion of activity at the base to a significant reduction in capacity. ***Hence it is estimated that the employment possibilities cover a spectrum from an increase of 2,825 FTE jobs to a contraction of 3,875****.*

It is clear that the brunt of any change would impact upon the urban areas of South Hampshire where most of the current workforce, live. However, because of the multiplier effect the impact would be felt across almost all sectors of the LEP economy. Thus any change that impacts directly on the Base is likely to have consequences throughout the LEP economy, even for sectors that are not commercially connected to it.

1. Introduction

This introduction specifies the purpose of the report and provides a non-technical synopsis of the methodology employed.

1.1 The purpose of the impact assessment

The aim of this report is to provide a socio-economic impact assessment of Her Majesty's Naval Base Portsmouth. A similar analysis, but with differing geographic boundaries and model construct, was last undertaken in 2007 on the eve of the global financial crisis. During the intervening years, the economic circumstances of both the United Kingdom (UK) and the world in general have changed markedly. In the case of the UK most areas of government expenditure including defence have come under pressure as part of the austerity programme designed to rebalance the aggregate level of public expenditure. The Royal Navy is not exempt from this retrenchment. Consequently, it has to sacrifice valuable physical resources and personnel. It is this substantial rebalancing which merits a fresh examination of the socio-economic significance of the base which, together with the raft of related establishments and companies in its vicinity, provides the UK with a world-class military asset.

In pursuit of its aim, the report presents a baseline measure of the economic impact (both direct and indirect) of Portsmouth Naval Base on the Solent Local Enterprise Partnership (LEP) area in terms of both income and employment generated.

Using the resulting comprehensive statistical material as a yardstick, the study then examines three distinct scenarios arising from the contraction of the Senior Service. These are ranked in terms of the potential impact on income and employment in the Solent LEP area. The scenarios are included so as to illuminate the effects of a range of possible changes affecting the Naval Base. It is, however, important to appreciate that the scenarios are not an attempt to predict policy decisions.

1.2 The Methodology employed

A blend of qualitative and quantitative analyses are deployed in the research. The qualitative aspect incorporates: a brief review of relevant former defence impact analyses (including previous work relating to the Portsmouth Naval Base), a survey of recent defence policy and an overview of the operations of BAE Systems (BAE), the UK's prime naval defence contractor. The underpinning assumptions and tools of analysis to be used in the study are also set out.

These include: a geographical definition and examination of the underlying economic features of the Solent LEP area; a non-technical description of the Solent input-output model; and an explanation of the assumption to be used in the scenario analysis.

The remainder of the study consists largely of quantitative analysis. To aid exposition, each major section includes a narrative preamble. This statistical aspect of the report begins by calculating the volume of employment and the value of primary expenditure generated by the activities associated with the Naval Base. This data makes it possible to generate a detailed 'picture' of company supply chains and permits identification of expenditures that are retained within the local economy, together with those that are subject to external (out-of area) leakage.

Primary data for this report has, for the most part, been provided by BAE and the Portsmouth Naval Base Commodore's Office[1]. The outcomes from the primary quantitative analysis are used for the input side of the input-output model. The interaction of the input data with the model's structural form produces output data for the indirect and induced effects of the primary spending. These combine to give estimates of 'downstream' income, output and employment for each industry sector within the Solent LEP local economy. This means that the impact is mapped across the local economy, thereby highlighting the importance of the Base to sectors seemingly divorced from it (for example, Retail and Business Services). The analysis provides a baseline of the estimated total economic impact of the facility. The approach adopted constitutes a rigorous methodology that has been employed in numerous research studies, including those of 2005 and 2007 relating to the Portsmouth Naval Base.

Calculating the impact of a reduction or expansion of activity at the Naval Base involves in-depth research, based in large measure on published statements, in order to arrive at realistic underpinning assumptions. For instance, issues such as whether all employment associated with a particular activity would be lost if work were to be transferred elsewhere and the probable timescale of such a change are important factors for consideration in deriving the overall impact. The baseline primary quantitative analysis is then adjustable in line with the assumptions and the indirect and induced effects calculated within the input-output model. By comparing the

[1] It is important to note that elements of this data have been made available in a more aggregated form than in 2007 because purchasing and personnel roles have become more centralized during the intervening years. As a consequence, the domicile pattern found in the disaggregated data for 2007 has been imposed on the current statistics to define the number of jobs and spending within the Solent LEP area. This is a reasonable assumption, as it is the ownership/ control of the entities that make up the Naval Base that have changed, whereas the workforce and activities in both shipbuilding and service provision remain essentially the same. The scenario analysis as required in objectives is not affected by this approach.

outcomes of the reduction or expansion scenarios with the baseline, the estimated impact of the change is calculated. As with the baseline this comparison will reveal where the effect will be felt within the local economy.

2. Background

In any impact analysis it is necessary to consider the context within which change is likely to take place. Based on official and other published work, the objective of this section of the report is therefore to provide that narrative.

2.1 Review of previous defence impact assessments

Since the end of the Cold War a quarter of a century ago, numerous studies have been conducted in order to establish the impact of a diminishing defence sector on local economies. Examples from the United States of America (USA) range from state or area-wide studies to work at individual military base level[2]. In the UK the overall size of the defence sector is significantly smaller than that of its American counterpart but the impact of change can still be of major consequence to local economies. As in the case of the USA, studies have been conducted at regional, sub-regional and individual base levels[3]. The commonality of this work is that it demonstrates that defence establishments have relatively high multiplier (knock-on) effects across all sectors of a local economy and hence extensively impact on military base hinterlands. A review of recent studies also reveals that they make extensive use of input-output models, so as to quantify the scale of economic impact.

As already indicated, this is not the first time that Portsmouth Naval Base has been placed under the 'economic microscope'. A study by the University of Portsmouth in 2005, for Fleet Support Ltd. and VT Shipbuilding, used the input-output technique to estimate the maritime defence dependency of the UK's central south coast region[4]. The analysis focused on the

[2] See for instance: Sommers, P, (2004), The Economic Impacts of the Military Bases in Washington State, Office of Financial Management, Washington State USA; Lahr, M L, (2004), The Economic Contribution of Military and Coast Guard Installations to the State of New Jersey, Centre for Urban Policy Research, Edward J Bloustein School of Planning and Public Policy; School of International Relations and Pacific Studies, (2011), The San Diego Military Economic Impact Study, University of California, San Diego; Ventura County Economic Development Association and Weaver Research and Consulting Group, (2006), Naval Base Ventura County 2006 Economic Impact Study; and Wright-Patterson Air Force Base, (2010), The Economic Impact of the Wright-Patterson Air Force Base.

[3] Examples include: Hunter, S, (2009), Military Presence and Economic Significance in the South West Region, Policy and Research, Wiltshire Council; Oxford Economics, (2011) The Economic Significance of Military Activity in Oxfordshire and the Hampshire Economic Area; Grainger, J, et al,(1992), Defence related employment in Portland and Weymouth, University of Portsmouth; Bishop, P, (2000) The Use of Input-Output Models in Local Impact Analysis - Case study of Devonport Naval Base, University of Plymouth; Highland and Islands Enterprise, (2010), Economic Impact of Moray RAF Bases.

[4] This area included all of the Isle of Wight.

impact of the Portsmouth Naval Base (inner and outer core)[5] on the local economy within a 20 mile radius of the facility. The study established that 'Greater Portsmouth' maritime defence activity supported the full-time equivalent (FTE) jobs of 38,000 people and had a total financial impact of £1.7billion(bn) [6], equivalent to 6 per cent of local Gross Domestic Product (GDP).

A follow- up study in 2007[7], also by the University of Portsmouth, using identical methodology but updated assumptions contained in various official publications, examined the likely impact of an expansion or contraction of activity at Portsmouth Naval Base. The area covered by this study excluded the Isle of Wight. It was concluded that the relocation of ships and associated support activity from Portsmouth to Devonport (but with retention of the shipbuilding facility at Portsmouth) would result in the loss of 21,000 FTE jobs and £361m of expenditure[8] in South Hampshire. Conversely, it was estimated that the relocation of those components of the surface fleet based in Devonport to Portsmouth would create an additional 3,000 FTE jobs and £65m expenditure in the locality[9].

This current study employs the same methodology as the previous two Portsmouth reports, although, as will be explained later in this section, both the geographic area considered and the construct of the model differ.

2.2 Reshaping Britain's defences

During the past 15 years, defence spending and activity in the UK has been the subject of periodic official appraisals. These have included: *The Strategic Defence and Security Review* (1998), *Delivering Security in a Changing World*, (2003), *Future Capabilities*, (July 2004), *MoD Efficiency Programme*[10], (2004), *Defence Industrial Strategy* (2005) the 2007 *Naval Base Review* and the Strategic Defence and Security Review (2010).

The 2007 Review constituted a penetrating assessment of the Royal Navy's three main fleet bases: Portsmouth, Plymouth and Clyde/Faslane. Its prime objective was to achieve: 'the

[5] This included training bases in Fareham and Gosport as well as Ministry of Defence support agencies.
[6] The report estimated that the inner core which included the Naval Base and all other maritime defence establishments in Portsmouth provided 17,200 FTE jobs within the local area and direct first round expenditures into the local economy were in the region of £296m. Downstream impacts were not calculated separately for the inner and outer core.
[7] Available at http://www.portsmouth.gov.uk/media/ECCS_regen_navalbasereport-final.pdf.
[8] This includes the impact to off-base training and logistical support agencies in Portsmouth and the surrounding area. The inner-core impact was estimated at between -11,300 and +2,900 FTE jobs; and between -£182m and +£41m direct first round expenditure.
[9] The principal reasons for the lower figure for additional jobs in the expansion scenario were that Devonport would retain its submarine fleet and Royal Marine Barracks and the training base at HMS Sultan (in Gosport) would, as planned, move to St Athan in South Wales as part of a tri-service defence training academy.
[10] Incorporating the 'Core Site Rationalisation Programme'.

optimal Naval Base infrastructure for the next 40 years to meet Defence Final outputs at best value for money to Defence …' The Ministry of Defence (MoD) emphasised that its decisions would be determined principally by the need for 'defence readiness.' The review concluded that all three bases should remain open. In late 2009 there was speculation that the then 11 Type-22 and Type-23 frigates based at Devonport would be moved to Portsmouth[11]. In April 2011 the Defence Minister, Gerald Howarth announced that the remaining frigates would remain base-ported at Devonport, "*for the foreseeable future*" presumably until the next Strategic Defence and Security Review in 2015[12].

Entering office in the spring of 2010 the Conservative /Liberal coalition faced a far harsher economic climate than could have been envisaged prior to 2008. It also inherited a defence programme which was officially estimated to exceed likely resource allocations by some £38bn, more than half of which was related to new equipment and support. Action was therefore required to close this military funding gap by bringing commitments and resources into balance, while simultaneously requiring defence to contribute to public expenditure cuts. The financial imperative for a major review of Britain's defence programme was therefore self-evident.

The fresh blueprint, the 2010 Strategic Defence and Security Review (SDSR) required a reduction in the defence budget of around 8 per cent and set out a reshaping programme based on extensive rationalization of the armed forces.[13] To this end, the Review envisaged a significant restructuring with consequent pruning of uniformed personnel in all three services totaling around 17,000 by 2015[14]. The intention was to furnish the UK with smaller but more agile armed forces, supported by enhanced intelligence gathering capability.

The contribution of the Royal Navy to the new model programme centres on a reduction in service personnel and surface platforms. The 35,000 sailors prior to the SDSR will be culled to about 30,000 by 2015 and 29,000 by 2020. There will also be fewer surface warships than at the time of the review's publication. Indeed, the Government is bent upon swift fleet reshaping. To this end, HMS Ark Royal has been decommissioned and its Harrier GR9 aircraft phased

[11] See, for instance, BBC News 15 April 2009 and Southern Daily Echo 16 April 2009.
[12] Statement by Gerald Howarth, BBC News 26 April 2011.
[13] See HM Government, *Securing Britain in an Age of Uncertainty: the Strategic Defence And Security Review*. Cm7948, October 2010, London: The Stationery Office.The government has also committed to more frequent defence reviews so as to avoid future misalignments of commitments and resources.
[14] For details of Army and RAF changes see SDSR pages 24-27. The Review also has important implications for civilian employment related to each of the armed services.

out[15]; four Type-22 frigates have been withdrawn from service; amphibious capability is to be reduced by decommissioning one of the helicopter landing ships in 2014 (HMS Illustrious); and one of the landing and command ships (HMS Albion) has been placed at extended readiness.

Table 1.1: Royal Navy surface fleet 2012 – Estimated numbers and complements

Type of Ship	Number	Estimated total complements	Estimated Portsmouth-based complements
Assault ships	4	1,885	685
Type-45 Destroyers	6	1,314	1,314
Type-23 Frigates	13	2,405	1,110
Mine hunters (Hunt)	8	360	360
Mine hunters (Sandown)	7	238	-
Ice patrol & Survey	5	1,146	90
River Class patrol vessels	4	170	170
Archer Class patrol boats	14	70	15
Scimitar patrol boats	2	10	-
Totals	63	7,598	3744
Future Ships			
QE Class Aircraft Carriers	2	1,364	1,364
Type-26 Frigates	13	1,690	-

Source: www.royalnavy.mod.uk, DASA
Note: Excludes embarked aircrew, and Royal Marines

The review envisages a future 'active' fleet composed of two Queen Elizabeth class aircraft carriers, currently under construction[16]; a nuclear propelled submarine fleet (4 ballistic missile and 7 Astute class 'hunter-killer' submarines); 19 destroyers and frigates[17]; and a larger number of smaller and specialist craft[18]. There are also 13 Royal Fleet Auxiliary (RFA) ships in service, ranging from replenishment 'oilers' and stores ships to landing ship docks, These are staffed by civilian crew and operate with Royal Naval vessels[19]. As far as can be ascertained from public

[15] The Harrier Fleet has been sold to the US Marines
[16] See statement by The Secretary of State for Defence (Mr Philip Hammond), Hansard, House of Commons,10 May 2012: Col. 140
[17] This includes the six new Type-45's and the 13 Type-26 Global Combat Ships that will gradually replace their older Type-23 counterparts.
[18] Eight mine countermeasure vessels, Hunt Class, (all based at Portsmouth); seven Sandown Class, (all based on the Clyde); four survey vessels, (all based in Plymouth); four River Class Fishery patrol craft and an Ice Patrol vessel (all based in Portsmouth) and smaller inshore patrol boats mainly attached to university training squadrons.
[19] RFA ships spend relatively long periods at sea. They are not usually base-ported at the main naval bases; for instance, the Bay class vessels are based at Marchwood military port, Southampton.

sources, as of April 2012 Portsmouth is the base-port for 29 Royal Naval surface vessels and just under half the crews (see Table 1 for more details). It will also be the 'home' location of the two new aircraft carriers.

2.3 BAE Systems – a profile

The defence company BAE is of crucial importance to the operational capability of the Royal Navy in terms of equipment provision, maintenance and support services. As such it is a key component of Britain's maritime capability. Hence, in undertaking a socio-economic impact study of the Portsmouth Naval Base, it is important to provide a profile of the company, with particular reference to its maritime underpinning role.

In its 2011 Annual Report, BAE states that it is: 'one of the world's largest and most geographically diverse defence, aerospace and security companies[20]'. It is the largest defence company in the UK and is both listed and headquartered in this country. The Group operates in five key home markets; the UK, the US, Saudi Arabia, Australia and India[21], has regional offices on all five continents, global sales of more than £19bn and employs some 93,500 people. BAE, like most international defence and security companies, was affected by the worldwide downturn with 2011 sales around 14 per cent lower than in the previous year (although operating profits were only 2 per cent less than in the previous year). The 2011 Investors' Day presentation makes clear that the company is expanding its presence in the intelligence and security sectors, which are viewed as key growth areas and increasingly important aspects of defence by both the USA and the UK.

The largest business segment of BAE is the UK Platforms and Services division, which had sales of almost £6.26bn in 2011 and employed 29,000 people[22]. The main components of the division are air, and maritime activities and shared services activities, including the UK-based Advanced Technology Centre. The company is by far the largest supplier of equipment to the Ministry of Defence accounting for 13 per cent of all MoD procurement expenditure in 2010-2011[23]. That stated, the company's dependence on UK defence spending has declined over the last decade as participation in international markets and more particularly the US has expanded. Looking to the future, the strategic objective of the company's UK Platforms and Services

[20] BAE Systems is the second largest global defence supplier after the US company; Lockheed Martin.
[21] India is a developing market with a significantly smaller BAE workforce that other "home" markets.
[22] The Company has five key business segments: Electronic Systems; Cyber and Intelligence; and three Platforms and Services Divisions covering the US, UK and International. All of these impact on the UK in one form or another.
[23] Source: MoD : United Kingdom Defence Statistics 2011. The MoD spent around £13.9bn on equipment in 2010/11.

division is to deliver profitability, not simply by building platforms but by also maintaining and upgrading them throughout their lifetime.

A 2011 report by Oxford Economics[24] highlighted the fact that BAE is the largest manufacturing-based employer in the UK in terms of the number of people employed. The report emphasised that the company is "a substantial base of intellectual capital" and its capital intensity means that productivity is around 85 per cent higher than the UK economy average. Overall, the report estimated that in 2009 the value added contribution of the Group to the UK economy was around £3.3bn, while net exports were worth £4.9bn[25]. The report also estimated that the total impact through direct employment, supply-chain spending (indirect) and consumer spending (induced) supported a total of 125,000 jobs across all sectors of the UK economy in 2009.

BAE also makes an important contribution to regional economies; most notably the North West, South East and Scotland. The research by Oxford Economics indicates that the South East region contains 24 per cent of Group employees, including a significant cluster within the Solent LEP area. Moreover, almost 40 per cent of manufacturing jobs in Portsmouth are estimated to be dependent on the company, with 75 per cent of staff residing in South Hampshire (there are particularly large concentrations in Gosport and Portsmouth).

BAE Maritime Services and Naval Ships operate from three locations within the Solent LEP area: at Broad Oak, the Airport, Portsmouth; Cowes on the Isle of Wight; and HM Naval Base. The total number employed at these sites exceeds 4,000.

In 2009 BAE signed a 15 year agreement with the MoD which guaranteed it a minimum of £230 million(m) a year shipbuilding and support work. This agreement specifies that BAE will provide support for complex warships (aircraft carriers and Type-45 destroyers) and base services at Portsmouth. There is no equivalent contract with respect to either Devonport or Faslane. That stated, BAE will inevitably feel the impact of fewer warship hulls to support and maintain. Indeed, during the past few years there has been periodic speculation on future surface warship base locations and facilities[26].

[24] Available at http://www.oxfordeconomics.com/free/pdfs/BAE_Systems_Economic_Contribution.pdf (accessed 1 May 2012).
[25] At 2009 prices.
[26] See, for example, the articles in *Warships International Fleet Review*, October and November 2010, which appraised the relative merits of Devonport and Portsmouth; Prospect Trade Union press release 23rd January 2012.

The SDSR made it clear that, while it would not be entirely business as usual at Portsmouth and Devonport, both would continue to have a role in the defence of the realm: "*Although the measures set out in this White Paper will require some changes at both locations, we will have a continuing requirement to sustain both bases. In the longer-term, the two new carriers will be based in Portsmouth*"[27].

2.4 UK surface warship construction

The position with respect to surface warship building following the completion of the two new 65,000 tonne aircraft carriers is more clouded. Already, BAE is reviewing its shipbuilding operations in the light of a likely reduction in throughput.

Following the acquisition of VT Group's shareholding in the BVT Surface Fleet joint venture in 2009, BAE is the UK's sole surface warship provider. In addition to the Portsmouth facility, it has others, at Scotstoun and Govan, within three miles of each other on the River Clyde in Glasgow. The 2009 Terms of Business Agreement with the MoD, referred to earlier, guaranteed a minimum level of work to BAE but in return the company is committed to delivering substantial efficiency improvements. Regrettably, once the carriers are completed there is unlikely to be a new naval project offering an equivalent similar workload and timescale. The next major MoD's order, for the 13 Type-26 frigates, to be built at the rate of approximately one a year from the early 2020s onwards, will be insufficient to keep all three yards fully active, unless supplemented by additional work[28].

In the light of possible workload concerns, the Type-26 is thus being designed with exports in mind. It will be a multi-role vessel of 5,400 tonnes with a crew of about 130 and is being designed to support three variants: anti-submarine, air defence and general purpose. The latter could prove of particular interest to a number of countries, including Brazil, Japan and Turkey[29]. The new vessels will be technically advanced and the fall in the external value of sterling (by around one-fifth in recent years) should also improve the price competitiveness of the frigate in foreign markets. However, the UK faces stiff international competition for potential sales because the international market is well provided with potential purveyors of modern vessels of

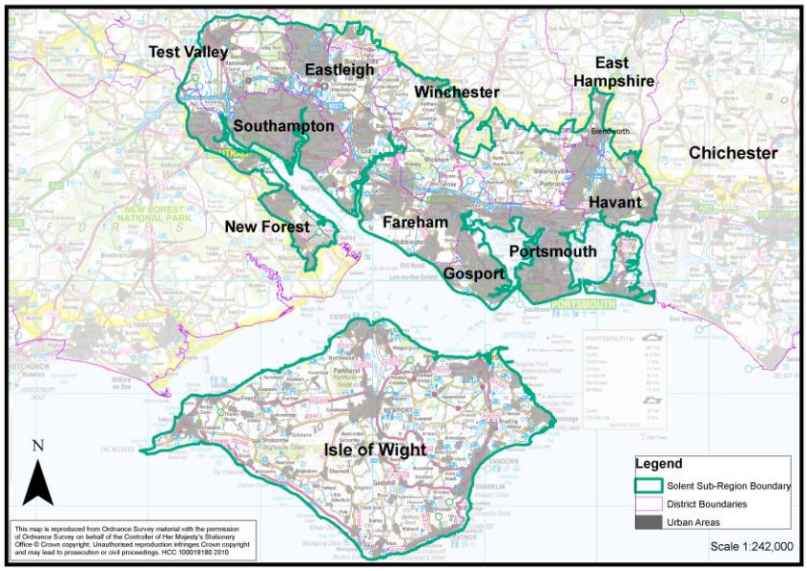
[27] SDSR p.32. On 10 May 2012 the Defence Secretary, Philip Hammond, announced that the UK would purchase the F35-B 'jump jet' version of the F35 fighter plane for aircraft carrier use. Britain will therefore be able to deploy maritime air power earlier than planned. Moreover, both carriers may be deployed with fixed wing aircraft, whereas the previously selected aircraft, the F35-C, would only have been able to operate from the one carrier to have been fitted with 'cats and traps'.
[28] Under existing plans, it is probable that there will also be a time gap between the completion of the carriers and the start of the Type-26 building programme. See the *Sunday Times*, 5 February 2012 (p.3).
[29] See the *Financial Times*, 17 January 2012 (p.4) and The Daily Telegraph, 5 April 2012 (p.21).

this kind and size. For example, the joint Franco-Italian FREMM multi-mission frigate, with a 6,000 tonne displacement and a crew of 108, has similar capabilities[30]. Substantial additional orders for the Type-26 are therefore not assured.

In the meantime, BAE is reviewing how best to retain the capability to deliver and support complex warships in the UK, in line with its 2009 commitments to deliver a viable surface shipbuilding division together with efficiency gains. BAE has appointed an independent company of experts, LEK Consulting, to provide analytical modelling to support this activity. Were it to be concluded that there is little prospect of a viable workload for all three yards then a substantial reduction in fixed costs could be reaped from closing one of them. The government has made it clear that it would not intervene either to prevent a yard closure or to influence where the axe should fall[31].

2.5 Geographic area of impact assessment

Figure 2.1: The Solent Local Enterprise Partnership Area



[30] For details see Multimission Frigate, France/Italy. Available at http:www.naval-technology.com/projects/fremm/. (accessed 9th May 2012).

[31] See the *Financial Times*, 31 January 2012. Available at www.ft.com/cms/s/0/c2eb85fe-4c34-11el-blb5-00144feabdc0.html (accessed 29th February 2012). The general tenor of national press articles dealing with possible shipyard closures indicates that Portsmouth is the leading candidate for possible culling. See, for example, *The Times*, 22 January 2012 (Business, p.1). However, the issue of Scottish independence could also play a role. As Professor Malcolm Chalmers of the Royal United Services Institute has pointed out: 'The future location of work on the Type-26 Global Combat Ship could be particularly sensitive in the event of an early referendum, with a decision not yet made as to whether this should take place in Portsmouth or on Clyde'. See M. Chalmers, The end of an 'Auld Sang': Defence in an Independent Scotland. Briefing paper, RUSI, April,2012,P.13. Available at http:www.rusi.org/ (accessed 14 May 2012). The importance of the referendum to the future of UK shipbulding is also underscored by a report in The Scotsman which quoted a Downing Street spokesman as confirming that:' No British warship has been built in a foreign country for the last 50 years and we do not intend to start doing that now'.(The Scotsman, 17 May 2012).

The area of impact in the current study is the Solent LEP area. As indicated in Figure 2.1, this comprises the main urban centres of South Hampshire, viz: the Cities of Portsmouth and Southampton; the Isle of Wight; Eastleigh, Fareham, Gosport, and Havant districts; and portions of East Hampshire, New Forest, Test Valley and Winchester.

The Solent LEP area has a population of just over 1.3m people and contains 50,000 businesses. It is estimated in this report that the local economy produces output of around £48.5billion (equivalent to GVA of around £23.7billion[32]) and supports around 485,000 full-time equivalent (FTE) jobs.

2.6 The Solent input-output model

The overall economic impact of expenditure emulating from the Naval Base (which is detailed in Chapter Five), can be divided into three parts – the direct, indirect and induced effects. To fully understand the importance of the base to the Solent LEP economy, all of these effects must be taken into account in any impact model. Figure 2.2 provides a diagrammatic representation of the direct, indirect and induced economic effects of the Naval Base. It is useful to explain what is meant by these terms.

2.61 Direct economic effects

The direct effect that the base has on the LEP economy can be partly measured through the direct employment that it provides to residents of the area and the salaries that it pays these employees (see Figure 2.2). The income earned as a result of this employment forms part of the disposable income of many households within the area. Although it is assumed that these households spend their disposable income entirely within the local economy, the extent to which this occurs in practice depends upon the industrial sectors present in the local economy. If a particular industry or sector is absent or under-represented in the local economy, 'leakages' will result as goods are imported from outside of the area.

In addition, a significant percentage of armed service personnel live in the LEP area only during the week or when their ship is in port. These individuals will consequently spend part of their disposable income in the local economy the rest will be spent at home or in other locations that their ship visits. Although at any point in time the majority of the Portsmouth-based ships will be on

[32] GVA is broadly speaking the sum of wages and salaries and operating surpluses (profits), the proportionate figure is derived from the intermediate demand column of national input output analytical tables (2005).

active service around the world, from year to year most will spend some time alongside in Portsmouth. However, while most of these crews have home addresses outside the LEP Area, they will impact upon, the local economy through their spending on local goods and services whilst they are in port or via the money that they remit to their families.

Further to this spending, daily commuters into the Naval Base can be expected to spend a fixed sum of money each working day in the local economy. In addition, visiting ships' crew and heritage tourists will spend money in a narrow band of sectors within the local economy whilst in the area.
A further direct effect takes place when the Naval Base and firms based there directly purchase a proportion of their supplies within the local economy. The magnitude of this effect is also dependent upon the structure of the LEP economy, and in particular, whether any industrial sectors are either not present locally or under-represented. Where this occurs, there may be 'leakages' from the local economy reducing the overall economic benefit of the Naval Base to the local area.

2.62 Indirect economic effects

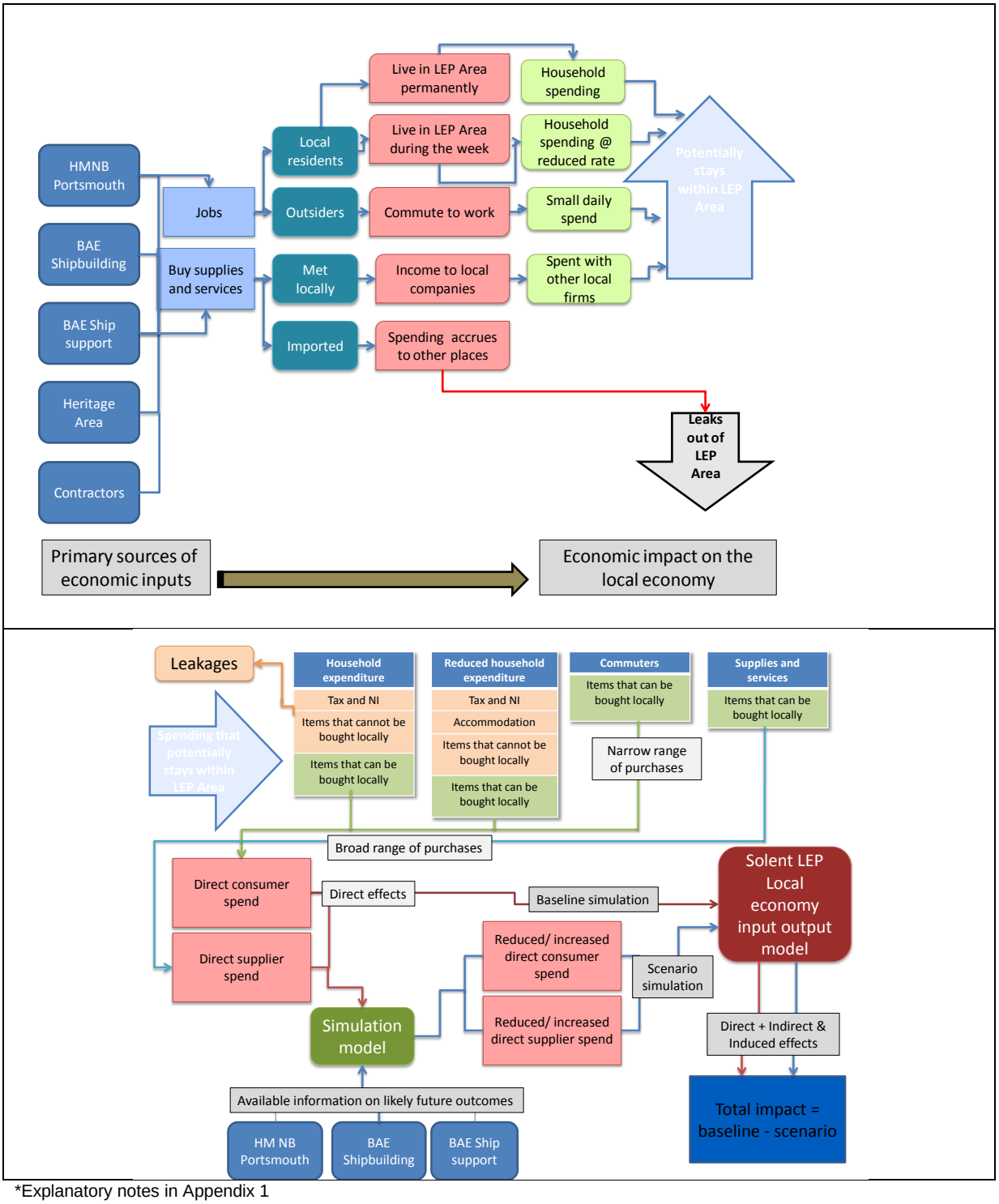
Direct demand for products and services used by the Naval Base leads to knock on (*multiplier)* benefits for other local firms. These effects continue on as firms in the defence supply chain purchase goods and services from other firms within the area as is illustrated in Figure 2.2. The overall size of the local multiplier effect depends upon the ability of local firms to supply the needs of the business, which supply the naval base. If certain industrial sectors are absent, 'leakages' out of the local economy occur, reducing the value of any multiplier effect.

2.63 Induced economic effects

Induced effects are associated with household (consumer) spending. The Naval Base is a major source of employment for the residents of the LEP area. As previously explained, this employment provides a significant boost to local household income, a proportion of which is spent directly by permanent and temporary residents, as well as visitors and commuters in the local economy.

The induced economic effect occurs when this primary spending is further re-circulated as residents are employed in shops and businesses and in the firms that supply goods and services to local shops and businesses. Local businesses will need to restock and staff will be employed to meet this demand. Employees of these firms will, in turn, receive a salary, which they themselves will spend as consumers in the local economy. Once again, a multiplier effect is created; the value of which will be dependent upon the ability of local firms to supply the needs of local consumers.

Figure 2.2: Components of the baseline*

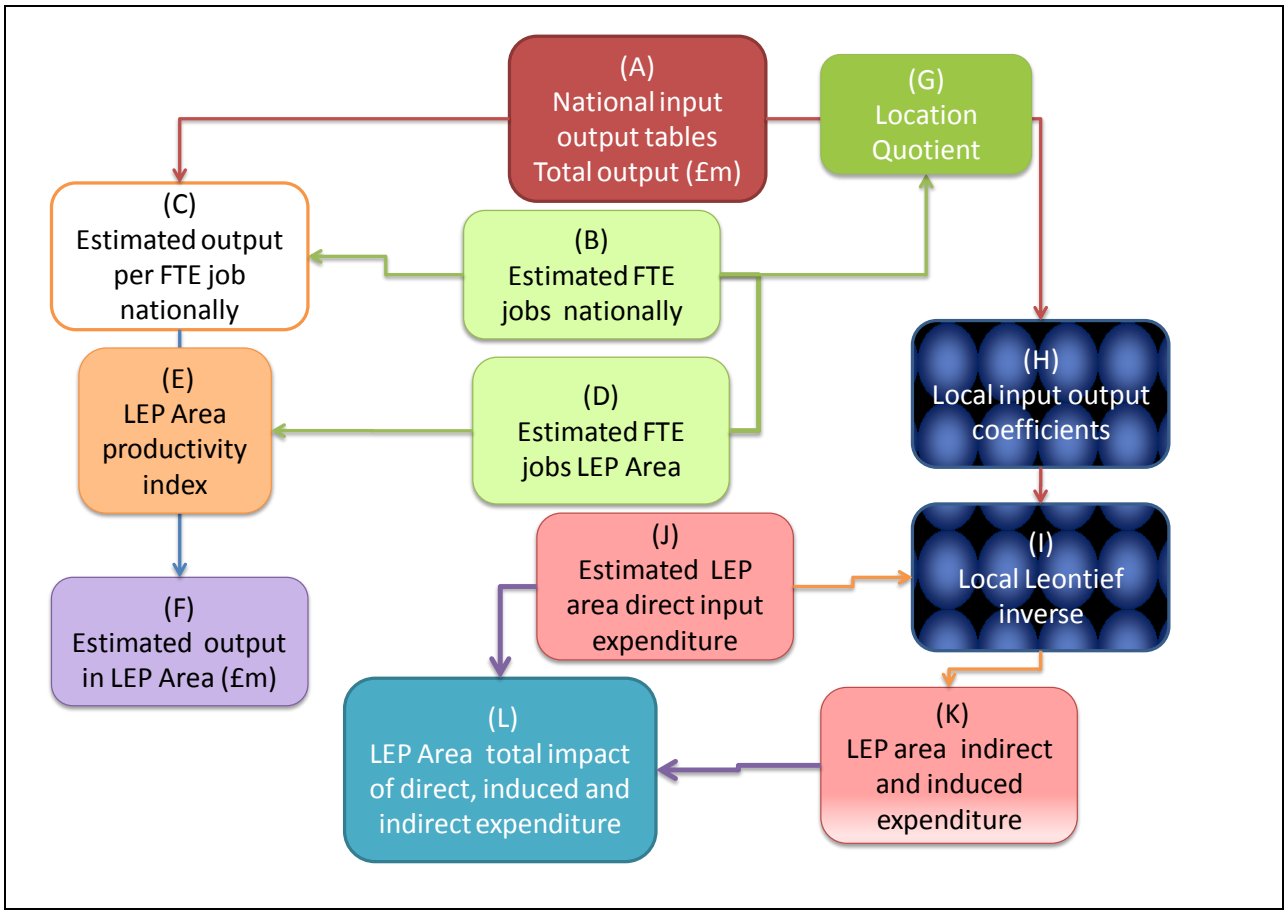


*Explanatory notes in Appendix 1

2.64 Input-Output methodology

The indirect and induced effects of the naval base on the LEP economy can be accurately measured by means of input-output analysis. The model used in this study was specifically constructed to provide an accurate simulation of the structure of, and interactions within, Solent LEP area economy. The input-output model derived makes it possible to trace the path of various multiplier effects through the economy, and thus enable a complete picture of the impact of the Naval Base on the local economy to be estimated, both for the baseline simulation and following any changes that may occur.

Figure 2.3: Flowchart showing the stages of the Input-Output modelling process



Output for each of the sectors in the LEP Area (F in Figure 2.3) can be estimated by multiplying the national output per FTE job figures by a LEP productivity index (E in Figure 2.3) which is based upon the number of local jobs in each of the 114 sectors (D in figure 2.3), weighted by a wage productivity index.

The employment structure within the LEP area can be compared to the national structure to obtain a local 'Location Quotient'[33] (G in Figure 2.3) which is used to scale down the national input-output tables, to derive local input-output coefficients (H in Figure 2.3). This produces a matrix, which can be manipulated to obtain the local Leontief inverse[34], which provides a simulation of the interactions within the LEP economy (I in Figure 2.3).

Primary data on direct spending by the Naval Base and household expenditure (J in Figure 2.3) can then be fed into the model to produce estimates for any resultant indirect and induced expenditure in the local economy (K in Figure 2.3). These can be combined with the direct economic effects to assess the overall impact of the naval base on the LEP local economy (L in Figure 2.3), both in terms of the baseline and any alternative scenario.

2.7 Scenarios to be examined

With any economic modelling exercise the outcomes are only likely to be as good as the assumptions. Consequently the objective is to make the assumptions as valid as possible given the current level of publicly available information. This inevitably changes as time progresses and the major 'actors' firm up on the decisions that they make for political and commercial reasons. One of the challenges faced by modellers is to keep the number of possible scenarios to a manageable number, so that there is clear differentiation between options.

Whatever key decisions are made by the MoD and BAE Systems in the future, the level of activity at Portsmouth Naval Base is likely to change because shipbuilding activity is currently at a peak level. Both organisations also need to prepare for the arrival of the Queen Elizabeth Class aircraft carriers, which are the two biggest ships ever built for the Royal Navy and will be based in Portsmouth when they enter into service. What is not known, however, is the extent to which the rundown of work on the construction of two aircraft carriers will be offset by alternative activity, such as MoD work on the Type-26 frigates and foreign orders.

[33] The local Location Quotient (LQ) expresses the relationship between the proportion of employment within a particular industrial sector in the LEP Area and the proportion in the same sector at a national level. For example, an LQ of 0.5 for a particular sector would indicate that the LEP Area has half the proportion of employment in that sector compared with the national level. Any sector in the LEP Area which experiences a higher proportion of employment than the national average is given an LQ of 1.

[34] Wassily Leontief received a Nobel Prize in 1973 for his contribution to the input-output analysis, the inverse of the matrix of input-output coefficients is named after him.

For comparative purposes, three indicative scenarios are considered in this report[35]. These three have been selected on the basis that they represent plausible outcomes in the light of recent trends in defence policy and funding[36]. Wherever possible the robust rationale behind the assumptions used in the previous 2007 study is incorporated. All the scenarios are set against the estimated current baseline, so that change can be measured. From a Solent LEP area perspective, Scenario 1 constitutes the most favourable outcome and Scenario 3 the least.

Scenario 1: Shipbuilding continues and additional ships move to Portsmouth

All surface fleet destroyers, frigates and future carriers are base-ported at Portsmouth; all Maritime Services activity, including deep refitting for these ships, also moves to Portsmouth; shipbuilding remains in Portsmouth and the BAE yards on the Clyde close. Under this scenario, Devonport retains its existing role with respect to submarines, hydrographic and amphibious ships; together with attendant Maritime Services and deep refitting.

There is an increase in employment under the Naval Base command and Maritime Services but shipbuilding jobs remain at the current level as work transfers from the Clyde. Household expenditure increases slightly, mainly as a result of an increase in ships' crew numbers. It is assumed that expenditure on supplies and services will remain at approximately the same level. Finally, all visiting ships' crew's expenditure remains or expands and income from defence-related tourism increases.

Scenario 2: Additional ships move to Portsmouth but shipbuilding ceases

All surface fleet destroyers, frigates and future carriers are base-ported at Portsmouth: all Maritime Services activity, including deep refitting for these ships, also moves to Portsmouth: shipbuilding relocates to the Clyde. Under this scenario Devonport retains submarines, hydrographic and amphibious ships with attendant Maritime Services and deep refitting.

There is an increase in employment under the Naval Base command and Maritime Services but there are significant reductions in shipbuilding jobs. Household spending reduces slightly, or remains at current levels, as increases in ships' crew spending offsets that of former

[35] That stated, there are numerous permutations with respect to how economic activity might expand or contract. An important feature of the Solent input –output model is that it can be used to 'fine-tune' the scenarios selected. It can also be calibrated to explore the implications of alternative assumptions.

[36] . Full or partial close was not modelled at this juncture for two reasons. Firstly it does not appear plausible under current defence policy; and secondly, it would inevitably have knock-on effects to other establishments such as Fleet Headquarters and the major training bases at HMS Collingwood and HMS Sultan and these are not incorporated into the model baseline and it is against this which any change would need to be compared.

shipbuilding employees. Expenditure with local supply chain firms is also reduced over a period of time as new suppliers are found closer to the Clyde.

Scenario 3: Shipbuilding at Portsmouth Ceases

Current surface fleet ships remain base-ported at Portsmouth, as do the Queen Elizabeth class aircraft carriers; Maritime Services remain but shipbuilding ceases and is relocated to the Clyde. Under this scenario the heritage attractions remain intact.

All ships' crews together with service and MoD civilian jobs under the Naval Base command remain as well as permanent and contractors' jobs associated with Maritime Services and heritage. The majority of shipbuilding jobs are shed. The impact is that most of the household spending by staff and contractors who work in shipbuilding is consequently significantly reduced. The expenditure with local supply chain firms associated with shipbuilding is also reduced over a period of time as new suppliers are found on the Clyde. All other expenditure remains intact.

3. The Direct Employment Impact of the Portsmouth Naval Base

This section of the report begins by examining the role of the Naval Base within the local defence cluster. It then considers the employment impact of the facility.

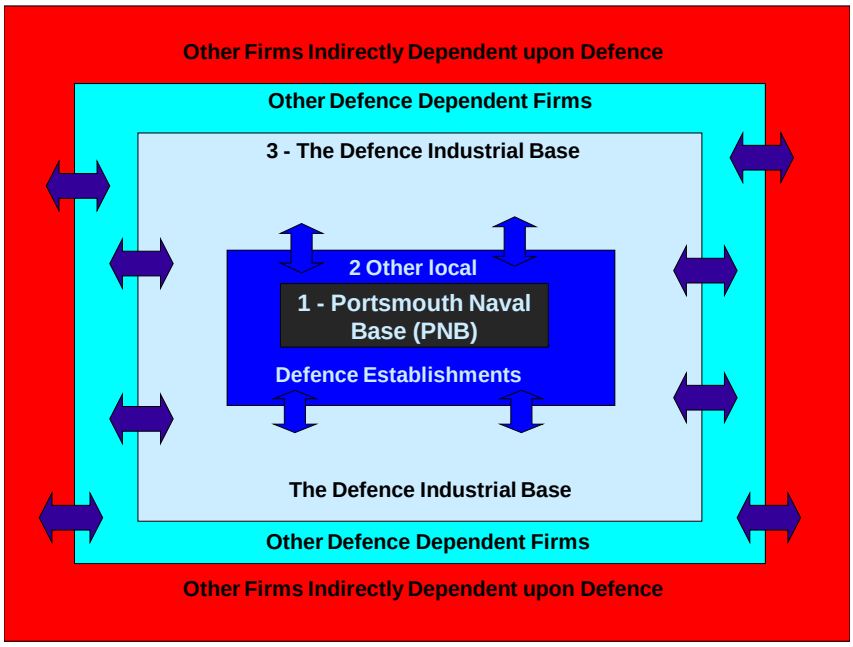
3.1 Local defence cluster

Portsmouth Naval Base is a major part of the local defence cluster. However, there are other important elements of the MoD and defence industrial base spread throughout the Solent LEP area. This fact is illustrated by Figure 3.1, which provides a summary of the main components of the region's local military sector. This encompasses the Naval Base, associated establishments, the defence industrial base and other dependent firms.

As Figure 3.1 suggests Portsmouth Naval Base is part of a larger raft of military establishments. Those outside the Naval Base include the Fleet Headquarters at Whale Island and the two major training bases, HMS Collingwood and HMS Sultan in Fareham and Gosport respectively. In addition, there are support bases including the Marchwood Military Port on Southampton Water, the Joint Support Chain base and the Institute of Naval Medicine at Gosport, the Defence Science and Technology Laboratory at Portsdown West, HMS Temeraire (Director of

Naval Physical Development) at Portsmouth and the Defence College of Policing and Guarding at Southwick Park. These together with the Naval Base are dependent on the defence industrial base to a greater or lesser degree.

Figure 3.1 Portsmouth Naval Base in context



The defence industrial base is also well represented in the Solent LEP area. It includes many of the largest suppliers to the MoD vis: BAE, Lockheed Martin, Northrop Grumman, Qinetiq, Serco Denholm Ltd and Vector Aerospace. Research by the South East England Development Agency (SEEDA) in 2007 indicated that 22 per cent of UK aerospace and defence companies were located in the Southeast. **I**n addition, Marine South East estimated that the value of maritime defence sector turnover in the Southeast Region was around £2.9bn (2004 prices)[37]. A current listing of defence related firms who are part of the ADS Group is also provided as Appendix 2. The defence industrial base in turn has commercial relations with supplier firms. Hence, the income generated by employment and the purchases by military establishments and the defence industrial base supports, indirectly, firms across the local economy.

According to DASA, around 27,500 MoD staff were based in Hampshire in January 2012. Just over 50 per cent of these were located within the Solent LEP area with two thirds of this total in Portsmouth. The vast majority within the LEP area (around 80 per cent) were military personnel.

[37] Marine South East, 2006, Economic Impact of the Marine Industries within South East England, see http://www.marinesoutheast.co.uk

Table 3.1 MoD personnel in the local defence cluster

Location	Military	Civilian	Total
Hampshire inc. Portsmouth & Southampton	21,300	6,200	27,500
Solent LEP area	11,125	2,725	13,850
Proportion in Solent LEP area	52%	44%	50%

Source: DASA January 2012; All figures have been rounded to the nearest 25.

3.2 Core activities at Portsmouth Naval base

There has been a naval base at Portsmouth since 1194. The present day base covers an area of 120 hectares, has three miles of waterfront, 62 acres of basins and 15 working dry docks. It is run as a partnering arrangement between the Royal Navy and BAE Systems. The Historic Dockyard area within the Base is leased to Portsmouth Naval Base Property Trust and attracts around 400,000 visitors per annum making it one of the South of England's largest tourist attractions.

There are a number of elements which constitute the present day Naval Base these include:

- Service and civilian personnel under the direct control of the Naval Base Commodore[38],
- Ships of the Portsmouth Flotilla,
- Royal Naval and tri-service lodger units[39],
- BAE Systems (with two businesses: Maritime Services and Naval Ships),
- Civilian contractors and their parent companies[40],
- Portsmouth historic dockyard heritage attractions and support services[41].

Before examining what might happen in the future it is essential to establish a baseline position of the current economic impact of Portsmouth Naval Base upon the Solent LEP sub-regional economy. Any change can then be compared against this baseline. The impact of the Naval Base clearly extends far beyond the perimeter of the base itself due to factors such as the presence of co-located support organizations, defence contractors, employment of locally domiciled civilian staff and service personnel. However, the Base is at the heart of the

[38] These include the staff of the Captain of the Base, the superintendant Fleet Maintenance and the Queens Harbourmaster.
[39] This includes other units that are located in the Naval Base and HMS Nelson but not responsible for the upkeep of the base itself. Data from DASA and the IDBR suggest that there are in the region of a further 1,500 service personnel and 1,080 Mod civilian personnel in this capacity.
[40] Includes Serco Denholm Ltd and Sodexo defence services Ltd.
[41] Includes Mary Rose Trust, National Museum of the Royal Navy, HMS Victory, Action Stations and the Warrior Preservation Trust

framework. Without it, other organisations and businesses may have little or no long-term role to play within the sub-region.

3.3 Core permanent direct employment impact

This section of the report identifies the core permanent direct employment by the Naval Base Command and BAE. This comprises the number of armed service and civilian personnel employed at the base under the control of the Naval Base Commodore together with the BAE permanent staff employed in shipbuilding and Maritime Services activity[42].

Table 3.2 - Direct employment of service and civilian staff (FTEs)

Area of residence	Portsmouth Naval base armed service staff	Portsmouth Naval base MoD civilian staff	Shipbuilding permanent & fixed term	Maritime Services services permanent & fixed term	Total
Within LEP area[1]	250	200	1,250	1,750	3,450
Outside LEP area[1]	150	<25	100	50	300
Total	400	225	1,325	1,800	3,750
2007 Comparison[2]	500	625	725	1,475	3,325
Change since 2007	-20.0%	-64.2%	81.3%	22.0%	12.9%

Source: Portsmouth Naval Base (PNB) Commodore and BAE (2012) and Portsmouth Naval Base Impact Study 2007.
Note: [1] Refers to the Solent LEP Area
[2] 2007 figures are stripped of lodger unit personnel, these accounted for 920 service and 640 civilian staff.
All figures have been rounded to the nearest 25.

Table 3.2 shows that there are around 3,750 full-time equivalent (FTE) service and civilian staff on the base. The vast majority 84 per cent work for BAE, with nearly 50 per cent of all permanent jobs in BAE's Maritime Services business. Contrary perhaps to popular conception, the overall total has increased since 2007 by more than 400. In percentage terms the largest increase has been in shipbuilding reflecting the high workload associated with the Type-45 destroyers and the QE class aircraft carrier programme. The table also serves to emphasise that there has been a significant reduction in MoD civilian staff and a loss of around 1 in 5 armed service personnel over the same period. The vast majority of staff, 92 per cent, live within the Solent LEP area, which suggests that the household income effect is likely to be significant.

[42] The overall figures were obtained from the naval base Commodore's office and BAE. However, unlike the 2007 study these were not broken down into areas of domicile and it was therefore assumed that the domicile patterns were similar to those found in 2007. Domicile patterns are slightly different for each cohort within the group but the majority live within the Solent LEP area.

3.4 Employment associated with ships' crew, contractors and the heritage area

The remaining employment within the core of the naval base is that associated with ships' crew, permanent contractors and the heritage area. Overall this grouping comprises over 8,150 jobs. It has seen an increase in employment of just over 1,000 this is entirely accounted for by the increase in contractor staff from just over 1,100 to nearly 3,500[43]. Taken together, around 70 per cent of these individuals live within the Solent LEP area.

Ships' crew spend a proportion of their time in Portsmouth when their ships are not on active duty, however DASA and other statistical bodies allocate crew numbers to their base ports. This is not unreasonable as many (particularly those with families) live in or close to their base port. As Table 3.3 shows, just under half of ships' crew are estimated to reside within the Solent LEP area. This cohort has declined by over 1,000, around 20 per cent, since 2007. The reduction in ships' crew numbers is due to both a decrease in the number of ships based in Portsmouth and the fact that the more modern ships entering service are more labour efficient.

Around 3,500 permanent FTE jobs are held by contractors; of these 975 are sub-contractors to BAE in shipbuilding and Maritime Services activities[44]. The remainder, are either contracted direct to Naval Base Command, or work for one of the civilian firms, such as Serco, Thales, Tighe, and Ably Access that have their premises within the Base. They provide essential services such as painting, building maintenance and harbour tug operations. Most contractors spend a proportion of their working time at the base, although some may be semi-permanently based there. In common with the 2007 study, it is assumed that these contractors spend around half their time in the base[45]. An interesting feature of the period since 2007 is that there has been a large increase in permanent contractors. This is a result of contractorisation of many functions as the base strives to be more cost effective and flexible.

The heritage area employs both permanent and seasonal staff to run and maintain the various attractions. There are just over 200 FTE staff employed in a variety of roles. The number has reduced slightly since 2007, as a consequence of increased efficiency. The number of visitors to the heritage area is slightly lower than in 2007, but this decline is in line with that of other similar attractions throughout the UK.

[43] This includes sub-contractors working directly for BAE
[44] The majority of these 88% work on the shipbuilding side.
[45] As indicated by the 2007 impact study of the Portsmouth Naval Base, anecdotal evidence suggests that their domicile pattern is similar to that of other staff at the base.

In addition to the 8,150 FTE jobs detailed in Table 3.3 there are over 800 visitors to the naval base each day. These individuals are not employed in the Naval Base but come in to undertake specific tasks, attend meetings or provide ad hoc services. They are not included within the employment totals but notional expenditure is ascribed to these individuals on the basis that they probably spend in a similar manner to other commuters.

Table 3.3 - Direct employment of crew, contractors and heritage staff (FTEs)

Area of residence	Ships' crew	BAE Sub contract staff	Other permanent contract staff	Heritage	Total
Within LEP area[1]	2,200	925	2,350	200	5,675
Outside LEP area[1]	2,300	50	125	0	2,475
Total	4,500	975	2,475	200	8,150
2007 Comparison	5,675	N/A	1,150	250	7,075
Change since 2007	-20.8%		115.9%	-20%	15.4%

Source: PNB Commodore and BAE (2012), Portsmouth naval base Property Trust, and Portsmouth Naval Base Impact Study 2007.
Note: [1] Refers to the Solent LEP Area
All figures have been rounded to the nearest 25.

3.4 Total direct employment impact

Table 3.4 demonstrates that the direct employment impact of Portsmouth Naval Base is approximately 11,900 FTE jobs; this includes all core permanent staff and other staff. It is clear from the table that this is an increase of around 1,600 on the 2007 figure and is mainly the result of the increase in shipbuilding activity driven by the scale of the Queen Elizabeth Class aircraft carrier programme. Three quarters of all jobs in the Naval Base are held by residents of the Solent LEP area and thus constitute an important proportion of both local employment and consumer spending.

In addition, there are a further 4,300 FTE MoD armed service and civilian jobs located elsewhere in Portsmouth. Some of them are lodged in the Naval Base and the adjacent HMS Nelson, with others at Whale Island, Horsey Island and the Military Hospital Unit (MHU) at Queen Alexandra Hospital, Cosham. There has been a slight decrease in these figures since 2007. In addition to these jobs[46] there are an estimated 700 FTE contractors' jobs within firms that are based within HMS Nelson and Whale Island.

[46] These figures are not show in Table 3.4 because there is no equivalent data for 2007.

Table 3.4: Total employment impact: including other non-core MoD staff in Portsmouth

Area of residence	Core permanent staff	Other core staff	Naval base total	Adjacent non-core MoD staff[2]	Total
Within LEP area[1]	3,450	5,675	9,125	2,650	11,800
Outside LEP area[1]	300	2,475	2,775	1,650	4,400
Total	3,750	8,150	11,900	4,300	16,200
2007 Comparison	3,325	7,075	10,400	4,625	15,025
Change since 2007	12.9%	15.4%	14.5%	-6.8%	8.0%

Sources: PNB Commodore and BAE (2012), DASA, IDBR and Portsmouth Naval Base Impact Study 2007.
Notes: [1] Refers to the Solent LEP Area; [2] Includes Lodger units, HMS Nelson, Whale Island, Horsey Island and DHU at Queen Alexandra (QA) Hospital
All figures have been rounded to the nearest 25.

Despite the fact that all the jobs are located in the Naval Base the staff are likely to be drawn from towns and cities right across the LEP area[47]. As can be seen from Table 3.5 the majority of people working in the Naval Base live in the urban areas of South Hampshire with significant concentrations in Portsmouth, Gosport, Fareham and Southampton. A majority of the Southampton cohort are employed in shipbuilding (65 per cent), whilst more than four out of every ten from Gosport are armed service personnel. Portsmouth residents provide significant proportions of the labour used in Maritime Services, contracting and the heritage area.

Table 3.5: Domicile of staff employed at the Portsmouth Naval Base

Area of domicile	Total base employment	Percentage of total
Eastleigh	150	1.2%
Fareham	1,475	12.4%
Gosport	1,850	15.6%
Havant	775	6.5%
IOW	100	0.9%
New Forest	50	0.5%
Portsmouth	3,625	30.4%
Romsey	25	0.2%
Southampton	1,075	9.0%
Outside LEP area	2,775	23.3%
Total	11,900	

Note: All figures have been rounded to the nearest 25.

[47] Whilst primary data was not available for this study, the domicile patterns for each employment cohort found in the primary data for the 2007 study have been applied to the employment figures in 2011 to estimate the likely current domicile pattern. This configuration of domicile is also used to distribute potential and net household income in the subsequent section.

4. The Direct Expenditure Impact of the Portsmouth Naval Base

4.1 Measuring expenditure

The primary focus of this section of the report is to estimate the income directly generated by the employment and supply chain activities within the Base, so that further income and employment effects can be estimated via the multiplier process.

In order to estimate the impact of the Naval Base upon the economy of the Solent LEP area, it is preferable to access reliable primary data from companies and individuals who work within the sector. Where it has not proved possible to access primary data, secondary data has been obtained from a range of sources[48], detailed within the report.

Expenditure is made up of four main elements:

- Household expenditures by service and civilian employees of the Naval Base as they spend their net income in the local economy;
- Supplies and services purchased by BAE and the heritage operations within the Naval Base from other local companies;
- Expenditure by visitors to the heritage area and service personnel visiting Portsmouth when their ships are in port;
- Commuter spending by staff domiciled outside the LEP area.

4.2 Household expenditure

Household expenditure relates to the 9,125 service and civilian personnel who live within the LEP area. Primary data on gross salaries for BAE and heritage staff was obtained from the companies. Cost of employment figures were available for BAE sub-contractors[49]. However, primary data for MoD civilians, armed service personnel and contractors was not available. To overcome this omission, the 2007 average salary figures for each cohort were inflated. The percentage change in the median weekly gross salary figures between 2007 and 2011 for Portsmouth[50] were used for this purpose. Postcode domicile ratios from the 2007 study were applied to determine the proportion of income available within the LEP area. Using this

[48] These are detailed within the report.
[49] For sub-contractors it was assumed the same cost of employment figures associated with BAE permanent staff applied. A further 20 per cent was deducted to account for contract supplier companies profit element. This figure is in line with the gross operating surplus figure for Other business services sector in the detailed national input output tables.
[50] As detailed in the Annual Survey of Hours and Earnings (ASHE) which is produced by ONS.

information, it is calculated that the gross impact of civilian salaries on the local economy is almost £194m per annum.

It is reasonable to surmise that civilian personnel who live locally spend all their income in the local area. In order to distribute local household expenditure it is necessary to calculate the proportion available as disposable income from gross salaries. After deducting for income tax and national insurance, in line with the effects of taxes and benefits on household income[51], the potential net household expenditure available was £159m per annum.

Turning to service personnel employed directly by the Base Commodore, it is estimated that the gross salary of local domicile personnel in this cohort is around £2.5m per annum equivalent to potential net household expenditure of just over £2m.

The expenditure impact of service personnel on Portsmouth-based ships requires a more complex calculation. Previous estimates suggest that, on average, ships spend 38 per cent of their time 'alongside'. In the absence of primary data, it was assumed that the distribution of rank and domicile is similar to that presented in the 2007 study. To calculate the potential spend of crews within the local economy, it was presumed that those with a local address spend all their net income locally, minus an amount equivalent to the average daily spend by visiting crew (£43) multiplied by the average number of days spent in other ports whilst away from Portsmouth[52].

Overall, this suggests that locally based ships' crew who live within the LEP area have gross spending power of around £24m per annum. After deductions this reduces to around £20m. That stated, the methodology may slightly underestimate the expenditure of ships' crews. In total it is estimated that the net effect of expenditure by locally based service personnel (on ship or shore), who live within the LEP area is in the region of £22m per annum. Overall if we add this £22m to the £159m earned by civilian staff employed within the Base, the total net impact of the household expenditure of all personnel who work at the Base and live in the LEP area totals £181m per annum.

[51] See for instance, "*The effects of taxes and benefits on household income (2009/2010")*, ONS, May 2011.
[52] The domicile distribution, average days in port, average spend and salary figures were calculated for each different class of ship in 2007, these have been applied in this study. In addition, research suggests that US and UK ships spend an average of 40% of their time at "sea".

4.3 Supplies and services expenditure

Supplies and services expenditure relates to the value of these two categories bought by BAE and the Heritage section of the Base from other local companies[53]. Primary data from BAE shows that the company spent around £192m in the last full year within the local economy[54]. Out of this over half was accounted for by the shipbuilding operation. If similar proportions to those found in the 2007 study are applied, it would appear that a further £190m is supplied elsewhere from within the UK and £80m from abroad.

For the heritage area, full information for all the organisations was not available. Consequently, estimates have been arrived at on the basis of primary information supplied by Portsmouth Historic Dockyard, the Portsmouth Naval Base Property Trust and published figures from some of the other organisations. These have then been distributed pro-rata on a staff headcount basis. As with BAE, it is assumed that 60 per cent of the expenditure is with companies outside the local area. On this basis it is estimated that the Heritage area spends around £5.5m per annum with other local companies.

Thus, in combination, BAE and the Heritage area are estimated to directly contribute some £197.5m to the local economy through their purchases of supplies and services from other local companies located outside the Naval Base but within the Solent LEP area.

4.4 Visitor and commuter expenditure

For the purpose of this report, there are three distinct categories of visitors who make expenditures within the local economy.

- Visiting ships' crew;
- Portsmouth-based crew who live outside the LEP area;
- Visitors to the Portsmouth Historic Dockyard.

The first of these are visiting ships' crews. Data from the Naval Base shows that 32 foreign naval ships visited the City in the last calendar year. The number of crew was just over 9,100. Assuming each ship stayed for an average of 4 days[55], this means that there were a potential

[53] Information on the spending by the Naval Base Commodore's operations was unavailable. It is highly likely that there is an element of local expenditure however, the amount, location and sectors into which that expenditure might be made cannot, at this time, be determined.
[54] Figures for the amount spend outside the LEP area were unavailable.
[55] The 2007 study provided a ship by ship breakdown of length of stay, and in the absence of more detailed information, it is assumed that this pattern was similar in the current year.

36,000 day visits. It is also likely that Royal Naval vessels which were not base-ported in Portsmouth also visited, as well as the crews of Royal Fleet Auxiliaries (RFAs). It is assumed that a proportion of these visits compared with foreign crews were similar to those found in the previous study.

Calculating the value of spending by visiting crews in the local economy is problematic because there are no reliable estimates for their expenditure when ashore. Crews were therefore treated as though they were overseas tourists, as per definitions provided by the Travel Trends Survey 2010. Hence, their average daily expenditure is treated as in line with tourists from their home geographic area, minus the proportion of expenditure the average tourist spends on accommodation (31 per cent). This gives estimated average daily spend figures for services personnel from North America of £68, for EU countries (including the UK) £43 and the Rest of the World £50. Because it is likely that some service personnel will be required to stay onboard during their stay we have assumed 20 per cent do not go ashore on any one day.

Using these assumptions it is calculated that the value of expenditure by visiting ships' crews, at 2011 prices, is in the region of £2.3 m per year[56]. To determine which sectors benefit from this expenditure it is assumed that the pattern of spending is similar to that of all tourists. The most recent edition of the United Kingdom Tourism Survey suggests that the sectors that benefit most are Catering (32 per cent), Transport (26 per cent) and Retail (23 per cent).

The crews of Portsmouth Based ships who reside outside the local area constitute the second category. These account for around 51 per cent of crew. It is assumed that they spend the equivalent of the average daily expenditure by visiting crews (£43), multiplied by the average number of days spent in Portsmouth[57]. In total it is estimated that the crews of Portsmouth-based ships who are domiciled outside the LEP area spend around £11.2 m per annum locally.

The third category is visitors to the historic Dockyard. Portsmouth Historic Dockyard Ltd. estimates that the base attracted 380,000 visitors in the last full year for which figures are available[58]. In line with the 2007 study it is estimated that 30 per cent of these are local people and thus have no additional effect on the local economy, 30 per cent are day visitors from

[56] This is almost two-thirds of the figure in the 2007 study.
[57] As with LEP area domicile crews, the domicile distribution, average days in port, average spend and salary figures were assumed to be similar to those calculated for each different class of ship in 2007.
[58] Year to March 2012.

outside the local area but live within 90 minutes drive time of the Base. The remaining 40 per cent are staying tourists who spend one or more nights in the local area.

In order to calculate their impact on the local economy it is estimated that those from within the 90 minute drive zone spend an average of £43 each (equivalent to visiting service personnel) whilst those staying overnight spend the full £62 estimated by the Travel Trends Survey. Based on these assumptions, it is calculated that visitors to the Historic Dockyard spend just under £14m in the local economy per annum.

In total therefore it is realistic to suggest that visitor expenditure overall adds some £27.5m to the local economy. The most recent edition of the United Kingdom Tourism Survey suggests that this expenditure primarily benefits the Hotel and catering, Retail and the Recreational, cultural and sporting activity sectors of the local economy.

Commuter expenditure is much less than the other categories outlined above. Service and civilian staff whose home is situated outside the LEP area can be expected to spend a small proportion of their income in the local area. According to the most recent Expenditure and Food Survey, this is likely to be spent in local shops (47 per cent), garages (22 per cent), pubs, cafés and restaurants (11per cent) and entertainment outlets (20 per cent). For the purpose of the study it is assumed that those living outside the LEP area spend an average of £6 per day in the local area. On the assumption that they work a 5day week and a 46week year, on average they spend £1,380 per annum in the local economy. The analysis indicates that the cumulative effect of this spending amounts to £0.64m.

4.5 Total direct expenditure

The combined direct expenditure impact derived from the location of companies and staff within the Portsmouth Naval Base is valued at £407m per annum. As is evident from Table 4.1 the major contribution (48 per cent) is from the purchase of supplies and services. The wages paid to local residents' accounts for a further 45 per cent and the residual 7 per cent is made up from visitors and commuter expenditure.

Whilst in theory, all of the household income is available to be spent in the local economy some of it will leak out due to consumers' purchases of imports and expenditure taxes. National household expenditure patterns show that these leakages constitute 25 per cent of all potential

household income. 60 per cent of this is spent on imports from outside the UK and the rest in the form of expenditure taxes such as VAT. In addition, if sectors are not present, or under-represented, in the LEP economy then not all local demand will be capable of being met by local suppliers. Leakages due to the structure of the local economy represent a further 16 per cent of potential household income loss. Thus it is estimated that potential household spending of around £73m will leak out of the local economy. This leaves around £109m per annum to be spent in the LEP area economy.

Table 4.1: Naval base net expenditure – the direct effect

Cohort	Amount[1] (£m)	Per cent of total
Service households[2]	22.3	5.5%
Permanent civilian households[2]	80.9	19.9%
Contractor households	75.1	18.4%
Heritage	3.2	0.8%
Household spending impact	*181.5*	*44.6%*
Crew and visitor spend	27.7	6.8%
Commuters	0.6	0.2%
Visitor impact	*28.3*	*7%*
Supplies and services	*197.5*	*48.5%*
Total	407.3	100.0%

Notes: [1] All figures are rounded to nearest £100,000
[2] Household incomes are net of income tax and employers and employees national insurance

Overall, the first round of local expenditure generated by economic activity at the Naval Base is equivalent to an injection of £334m into the Solent LEP economy each year. Just over 40 per cent of this is in the form of household and tourist expenditure (£136.6m) and just under 60 per cent (£197.5m) from the purchase of services and supplies. In combination these two amounts provide the catalyst for the induced and indirect multiplier effects. What is apparent is that this injection goes right across the industrial and commercial sectors of the local economy. The impact is more concentrated in Manufacturing and Business and property services. The former includes Shipbuilding and the latter Facilities management two sectors where BAE plays a dominant role within the Portsmouth Economy.

Table 4.2: Distribution of 1st round expenditure throughout the LEP economy

Sector	Household and tourist expenditure £million	Supplies and services £million	Total 1st round injection £million
Primary products	0.5	0.0	1
Manufacturing and utilities	10.4	63.5	74
Construction	1.4	24.9	26
Private motor vehicle transportation	8.4	0.0	8
Wholesale distribution	8.8	0.5	9
Retail distribution	27.8	0.0	28
Hotels and catering	26.6	0.4	27
Other transport services	8.1	3.1	11
Postal and telecommunications	1.9	0.4	2
Banking and finance	11.1	0.5	12
Business and property services	14.1	61.5	76
Public administration and defence	0.8	0.0	1
Education and health	5.5	36.1	42
Culture, recreation and sport	7.5	0.3	8
Other services	3.6	6.4	10
Total	136.6	197.5	334

Note: [1] All figures are rounded to nearest £100,000

The following section of the report examines how this initial injection of spending percolates through the LEP area economy. Together with the output resultant from the direct employment at the base, this provides the baseline impact of Portsmouth Naval Base against which any potential change will need to be assessed.

5. The Baseline Impact of the Portsmouth Naval Base

This Section provides estimates of the output and employment impact of the Naval Base, including the effect of the multiplier, commencing with the direct effect.

5.1 Direct effects of employment and expenditure

As reported in Section 2.4 the LEP area economy produces gross output of around £48.5billion. This is the result of the combination of productive capacity and labour within the area. Sectors have differing rates of productivity with capital intensive industrial sectors producing high rates of output per employee and other service sectors low rates.

The output figures in £m (column 1 of Table 5.1) relates to all transactions between firms, enterprises and individuals located within the Solent LEP area economy. These include exports of goods and services as well as stock building and fixed capital formation. The accompanying levels of jobs relate to the employment structure of the local economy, as presented in the 2010 BRES up-rated for estimated growth over the last year[59].

Table 5.1: Portsmouth Naval Base estimated output and employment (2011)

Sector	LEP total output (£m)	LEP total FTE Employment	Naval Base output (£m)	Naval Base FTE Employment
Primary products	311.4	4,625	0.0	-
Manufacturing	9,528.1	54,250	259.3	2,675
Construction	4,415.2	37,525	49.4	425
Retail & wholesale	4,019.1	60,675	5.2	75
Hotel and catering	1,660.5	26,300	5.4	75
Transport telecom and vehicle repairs	6,157.6	39,350	68.5	625
Financial and business services	11,843.1	101,825	109.4	2,525
Public sector[1]	8,816.5	135,775	434.3	5,150
Cultural and other services	1,779.6	25,100	27.3	325
Total	48,531.3	485,425	958.7	11,900
Average output per FTE £'s	99,975		80,571	

Source: University of Portsmouth, 2012
Note: [1] Includes armed service personnel.
All employment figures are rounded to the nearest 25, output figures to the nearest £100,000

The largest sectors in the local economy, by output, are Financial and business services and Manufacturing (the latter has high value-added components). In terms of employment, the local economy generates more than 566,000 jobs, which equate to around 485,000 FTE jobs. The most significant employment creators are: the Public sector, which includes direct MoD service and civilian employment (28 per cent of all jobs); Financial and business services (21per cent) and Retail and wholesale (12 per cent). Manufacturing, which accounts for about 11 per cent of

[59] It should be noted that the table shows the total number of jobs and output created by all firms located within the local economy. Due to commuting patterns and out-of-area spending, these totals may not be the same as the number of economically active individuals within the local area, or the amount that they might spend locally.

total employment, is somewhat less significant. The final row of table 5.1 shows that the estimated output per FTE is lower in the Naval Base than in the LEP area economy in general which suggests lower value added jobs within the facility than in the rest of the LEP area. This is primarily because value added per FTE in Facilities management (the sector in which BAE Maritime Services business is located), is one of the lowest across both the national and local economies. The estimated total direct output from the Naval Base is almost £959m per annum. By sector this accounts for some 4.9 per cent of Public sector output and 2.7 per cent of all manufacturing. In total the Base provides 2 per cent of Solent LEP output.

As explained in section 4, the other key element of the Naval Base is the impact of its expenditure on the wider economy. This creates the indirect and induced effects referred to earlier and it is to the impact of these that we turn next.

5.2 Indirect and induced effects of employment and expenditure

The input-output model used in this study was specifically designed to enable the magnitude of the multiplier effect of Base expenditure to be measured from a number of standpoints. Firstly the impact of the direct expenditures by the Base and its' employees; this is often termed the "first round" effect. Secondly, the additional indirect and induced effects that occur when the first round expenditure creates further demand through the second, third and fourth tier supply chain linkages[60]. These are normally referred to as the subsequent rounds or multipliers.

Overall, the first round, induced and indirect effects of expenditure from all Naval Base activity within the LEP areal creates additional final output in excess of £723m. This total figure comprises £334m from the first round effect and a further £145.5m from the induced and £243.5 from the indirect effect.

Table 5.2 sets out the full results of the model simulation. The table is divided as follows:

- Column 1 the direct first round expenditures by Naval Base businesses, households and visitors;
- Column 2 - the induced multiplier effects resulting from initial spending by households and visitors;

[60] The additional spending created through the multiplier decreases with each additional round, until such time as it is effectively zero

- Column 3 - the indirect multiplier effect resulting from initial spending on supplies and services;
- Column 4 - the total effect (the sum of columns 1 to 3).

Table 5.2: The downstream expenditure effect of the Naval Base

Sector	1st round effect £million	Induced effect £million	Indirect effect £million	Total downstream effects £million
	0.5	1.1	1.6	3.2
Manufacturing	73.9	26.2	54.2	154.3
Construction	26.3	11.3	27.6	65.2
Retail & wholesale	37.1	4.9	10.8	52.7
Hotel and catering	27.1	1.5	1.8	30.4
Transport telecom and vehicle repairs	22.0	29.0	34.8	85.8
Financial and business services	87.1	58.7	91.4	237.2
Public sector	42.4	7.3	13.7	63.5
Cultural and other services	17.7	5.5	7.5	30.7
Total	334.1	145.5	243.5	723.1

Note: All output figures are rounded to the nearest £100,000

This expenditure in turn creates additional employment within the LEP economy. Average productivity figures are used to estimate the additional levels of FTE employment that are created. The relationship between different sectors is not a linear one because the model builds in the diverse productivity levels that apply for each industrial sector. This is a key feature of input-output models that is not usually present in alternative approaches which provide aggregated figures for the multiplier.

Table 5.3 shows that expenditure from the base supports almost 7,900 additional FTE jobs across the LEP economy. The main beneficiaries of these additional jobs are the Financial and business services sector, Public services and Manufacturing. The key feature of the table is that it demonstrates how the activity at the Naval Base impacts across all industrial sectors and as shown previously with the direct employment figures is likely to be right across the urban areas of South Hampshire.

Table 5.3: The downstream employment effect of the Naval Base

Sector	1st round FTE jobs	Induced effect FTE jobs	Indirect Effect FTE jobs	Total downstream effect FTE jobs
Primary products	<25	<25	<25	50
Manufacturing	600	150	325	1,075
Construction	225	100	225	550
Retail & wholesale	650	50	100	800
Hotel and catering	425	25	25	475
Transport telecom and vehicle repairs	200	275	350	825
Financial and business services	950	625	1,050	2,600
Public sector[5]	775	125	200	1,100
Cultural and other services	225	75	100	400
Total	4,050	1,425	2,400	7,875

Note: All employment figures are rounded to the nearest 25

5.3 Baseline measures of local output and employment

From the above information it is possible to calculate the overall or baseline impact of the Naval Base. The combination of the primary output and employment at the naval facility, together with the downstream expenditure and the jobs it supports, provides the baseline against which change can be subsequently measured.

Table 5.4: Baseline impact of Portsmouth Naval Base

Sector	LEP Output £million	LEP FTE Employment	PNB output £million	PNB FTE employment
Primary products	311.4	4,625	3.2	50
Manufacturing	9,528.1	54,250	413.6	3,750
Construction	4,415.2	37,525	114.6	975
Retail & wholesale	4,019.1	60,675	57.8	875
Hotel and catering	1,660.5	26,300	35.8	575
Transport telecom and vehicle repairs	6,157.6	39,350	154.3	1,450
Financial and business services	11,843.1	101,825	346.6	5,150
Public sector[5]	8,816.5	135,775	497.8	6,250
Cultural and other services	1,779.6	25,100	58.1	725
Total	48,531.3	485,425	1,681.8	19,775
Output and employment multipliers			1.75	1.66

Note: All output figures are rounded to the nearest £100,000 and all employment figures are rounded to the nearest 25

Table 5.4 shows the baseline position of Portsmouth Naval Base (including the subsequent multiplier effects). Overall it generates output of £1.68bn and supports both directly and indirectly 19,775 FTE jobs. These figures equate to 3.5 per cent of LEP output and 4.1 per cent of all FTE jobs. The base is particularly important to manufacturing in that it supports nearly 7% of all such employment in the Solent LEP area. It is even more important to specific sectors such Shipbuilding (70 per cent of all FTE jobs); Property and facilities management (27 per cent); Metal goods (22 per cent) and Public administration and defence (14 per cent).

The other key message contained within Table 5.4 is the output and employment multipliers (shown in final row of the table). What these indicate are the ratio between direct output and employment and total output and employment. In the case of the Naval Base every £1m directly generated by its presence stimulates another £750,000 of spending elsewhere in other sectors in the LEP economy. In the case of employment for every 100 FTE jobs at the Naval Base the resultant downstream spending[61] stimulates another 66 jobs elsewhere in the LEP area.

Even without taking account of the co-located military establishments and the wider defence industrial base, in both scale and reach Portsmouth Naval Base has a significant impact on the Solent LEP economy[62].

The next section of the report goes on to examine the impact of potential change in the role and structure of the Naval Base.

6. Impact of likely change at Portsmouth Naval Base

6.1 Scenarios explained

A scenario is a supposition of what might happen at some point in the future. By its nature, it constitutes an educated guess and often fails to reflect what eventually occurs. Even in stable periods, military programmes are almost constantly under review as events both internal and external to the UK produce unexpected challenges. In the current rather uncertain political and economic climate the task becomes even more fraught. Therefore, out of the many scenarios that might be applied to Portsmouth Naval Base, some are more credible than others.

[61] On average 100 FTE naval base jobs result in downstream expenditure of around £6million.
[62] It can be assumed that the presence of military establishments and defence-related organisations is attributable to the fact that Portsmouth has for centuries been regarded as the “home” of the Royal Navy.

This report examines just three possibilities ranked from most favourable to least favourable for the LEP area. These are based on the best credible information that is currently available. The scenarios are ranked from 1 to 3, with 1 being the most favourable to the LEP area economy and 3 the least.

This section of the report starts by setting out the assumptions underpinning each of the scenarios and then analyses the impact of each in turn.

6.2 Assumptions underpinning the scenario analysis

The overriding assumptions/ clarifications underpinning all three scenarios are as follows:

- All expenditure is at constant 2011 prices.
- Any rundown of activity is assumed to take place over a period of time, probably during the five years following the peak of activity in the build of the second QE class carriers (likely to be from 2013/14).
- The Terms of Business Agreement (TOBA) between the MoD and BAE which was signed in 2008 and runs to 2023 guarantees BAE warship build and repair work, but this can be cancelled at any time subject to stipulated conditions and costs.
- The new classes of ships constructed by BAE; Type 45, QE class carriers and Type 26 will be subject to through-life support which includes ship upgrade, repair, engineering, logistics, and support services.
- Devonport is licensed to carry out deep maintenance and disposal of nuclear submarines whereas Portsmouth is not, so this work is likely to remain in Devonport.
- Amphibious ships are generally co-located with their embarked forces (Royal Marines) it is expected that these will continue to be primarily based in the West Country.

More specific assumptions apply to each scenario and are set out below:

Scenario 1: This is a growth case where shipbuilding continues at Portsmouth at or around current levels and surface carriers, destroyers and frigates are all base-ported at Portsmouth. The rationale for this is that BAE could rationalise their shipbuilding and support activities at a single site (Portsmouth). Further, as the new classes of surface vessels are to be built and supported by BAE there are potential economies of scale by bringing all that work, including

deep maintenance of these ships, to a single site[63]. The consequences are that seven frigates and their crews based at Devonport move to Portsmouth and that shipbuilding remains at the current high tempo, possibly also taking on export activity.

Thus it is assumed that:
Ships' crew numbers increase by 44 per cent[64], Naval Base civilian and armed service staff under the control of the Base Commodore increase by 20 per cent, shipbuilding staff levels remain at current levels, BAE Maritime Services staff and other contractors increase by 10 per cent, heritage site employment remains at current levels.

On the expenditure side, ships' crew household spending increases by 34 per cent[65], Naval Base civilian and armed service staff spending under the control of the Base Commodore increase by 10 per cent, shipbuilding staff spending remains at current levels, BAE Maritime Servicesstaff spending and other contractors increase by 5 per cent, heritage site spending remains at current levels. Heritage visitor numbers and spending rises by 25 per cent; visits by ships' crew by 10 per cent and commuter spending is enhanced by 7 per cent. Spending on supplies and services remains at around current levels.

Scenario 2: This is a situation where growth in one activity is offset by a reduction in another. In this case shipbuilding ceases at Portsmouth and the BAE workload is shared by the two Clyde yards and surface carriers, destroyers and frigates are all base-ported at Portsmouth. The rationale is that BAE concentrate their two maritime businesses segments of shipbuilding and Maritime Services at two centres of excellence (the Clyde and Portsmouth) but have additional capacity for export orders and more capacity for deep maintenance. The consequences are that seven frigates and their crews based at Devonport move to Portsmouth and that shipbuilding activity winds down in Portsmouth towards the end of the QE class aircraft carrier project.

[63] Devonport would continue to be the base-port for nuclear submarines and amphibious ships and would carry out deep maintenance on these ships. Flag Officer sea training would also remain located at Devonport in the medium term.
[64] This figure assumes crew numbers include the seven additional frigates and both QE carriers but exclude the crew numbers associated with Illustrious is decommissioned.
[65] In common with the assumptions in previous reports, some crew are anticipated to remain domiciled in Plymouth (probably for family reasons). This also applies to a lesser extent to other cohorts of staff.

Thus it is assumed that:
Ships' crew numbers grow by 44 per cent, Naval Base civilian and armed service staff under the control of the Base Commodore increase by 20 per cent, shipbuilding staff levels reduce by 90 per cent, BAE Maritime Services staff and other contractors are boosted by 10 per cent, heritage site employment remains at current levels.

On the expenditure side, ships' crew household expenditure increases by 34 per cent, Naval Base civilian and armed service staff spending under the control of the Base Commodore increase by 10 per cent, shipbuilding staff spending reduces by 70 per cent[66], BAE Maritime Servicesstaff spending and other contractors rise by 5 per cent, Heritage site spending remains at current levels. Heritage visitor numbers and spending increases by 25 per cent; visits by ships' crew by 10 per cent and commuter spending decreases by 11 per cent. Spending on supplies and services reduces by 45 per cent[67].

Scenario 3: This is an instance where the reduction in shipbuilding activity is not offset by additional vessels moving to Portsmouth or by BAE increasing the level of deep maintenance at the base. In this case shipbuilding ceases at Portsmouth and the BAE workload is shared by the two Clyde yards. The present complement of destroyers and six frigates remain at Portsmouth and are joined by two QE class aircraft carriers. The rationale is that BAE concentrates on shipbuilding in a single centre of excellence and that Maritime Services operations become more peripatetic, utilising the facilities at both Devonport and Portsmouth for deep maintenance as and when necessary. The consequences are that shipbuilding activity winds down towards the end of the QE class carrier project and that Maritime Services continues at around its current level.

Thus it is assumed that:
Ships' crew numbers increase by 15 per cent[68], Naval Base civilian and armed service staff under the control of the Base Commodore remain at current levels, shipbuilding staff levels reduce by 90 per cent, BAE Maritime Services staff, other contractors and heritage site employment also stays at current levels.

[66] In common with the 2007 report it is assumed that 10 per cent remain as a skeleton staff, 20 per cent of staff take early retirement and remain in the sub-region, and 70 per cent are made redundant or move to another location.
[67] This reflects the fact that although shipbuilding consumes slightly more than half BAE spending on supplies and services, there is likely to a slight increase in Maritime Services activities.
[68] The increase is due to the QE class aircraft carriers coming into operation.

On the expenditure side, ships' crew household expenditure rises by10 per cent; Naval Base civilian and armed service staff spending under the control of the Base Commodore remains at current levels; shipbuilding staff spending reduces by 70 per cent; BAE Maritime Services staff spending, other contractors and heritage site spending continues at existing levels. Heritage visitor numbers, spending and visiting ships' crew spending all remain constant. Commuter spending reduces by17 per cent. Spending on supplies and services diminishes by 45 per cent.

For purposes of clarity a listing of the percentage changes under each scenario is provided in Appendix 3.

6.3 The impact of each scenario

The outcome of Scenario 1 is an overall increase in direct employment and output and a resultant increase in downstream output and employment. Table 6.1 shows that overall the number of direct FTE jobs at the Naval Base increases to 14,425 (a significant increase of 2,525 when compared with the baseline figure). The output associated with all these jobs is just under £1.2billion (an increase of over £200m from the baseline figure). Downstream employment and output are 8,175 and £748m respectively. Overall in Scenario 1 the base is estimated to generate total output of more than £1.9billion per annum and this supports 22,600 FTE jobs. The total FTE jobs figure is around 2,800 higher than the baseline figure, with the largest increase in the Public sector, mainly associated with additional crew relocating to Portsmouth.

Table 6.1: Outcomes from Scenario 1

Sector	(A) Direct FTE jobs	(B) Output from direct jobs £million	(C) Downstream output £million	(D) FTE jobs from downstream output	Total FTE jobs A+D	Jobs change from baseline
Primary products	-	0.0	3.4	50	50	-
Manufacturing	2,725	264.4	157.0	1,075	3,800	50
Construction	450	54.4	66.1	550	1,000	50
Retail & wholesale	100	5.7	56.0	850	950	75
Hotel and catering	100	5.9	34.1	550	650	75
Transport telecom and vehicle repairs	700	75.3	90.8	850	1,550	100
Financial and business services	2,775	120.3	243.6	2,675	5,450	300
Public sector	7,250	612.0	64.4	1,125	8,375	2,125
Cultural and other services	325	28.6	32.9	450	775	50
Total	14,425	1,166.5	748.3	8,175	22,600	2,825

Note: All employment figures are rounded to the nearest 25, output figures to the nearest £100,000

The outcome of Scenario 2 is more mixed. Whilst the number of direct FTE jobs increases by 575 the output associated with these jobs only rises by around £20m. The reason for this is that the lost shipbuilding jobs are higher value added than the additional armed service jobs and those in Maritime Services activity. Overall, there are 12,475 direct jobs which support around £0.98billion of output. The loss of household expenditure from the higher paid jobs (and more crucially the supplies and services expenditure associated with shipbuilding activity) means that downstream output and employment are reduced from the baseline figure. The estimated downstream output of just under £508m is £215m lower than the baseline figure. The consequence of this lower additional spending means that the estimated number of downstream FTE jobs is 5,575, some 2,300 less than the baseline figure. Hence, in this scenario the Naval Base supports approximately 18,050 FTE jobs in the LEP area, a figure some 1,725 lower than the current baseline position.

Table 6.2: Outcomes from Scenario 2

Sector	(A) Direct FTE jobs	(B) Output from direct jobs £million	(C) Downstream output £million	(D) FTE jobs from downstream output	Total FTE jobs A+D	Jobs change from baseline
Primary products	-	£0.0	£2.4	25	25	-
Manufacturing	775	£76.8	£98.1	650	1,425	-2,325
Construction	450	£54.4	£40.4	350	800	-175
Retail & wholesale	100	£5.7	£44.5	700	800	-75
Hotel and catering	100	£5.9	£30.0	475	575	-
Transport telecom and vehicle repairs	700	£75.3	£67.0	625	1,325	-125
Financial and business services	2,775	£120.3	£161.1	1,700	4,475	-650
Public sector	7,250	£612.0	£39.7	700	7,950	1,675
Cultural and other services	325	£28.6	£24.6	350	675	-50
Total	12,475	£979.0	£507.7	5,575	18,050	-1,725

Note: All employment figures are rounded to the nearest 25, output figures to the nearest £100,000

Table 6.3 demonstrates that the resulting outcome of Scenario 3 is a clear decrease from the baseline position. The table shows that direct FTE jobs and associated output are 10,600 and £0.83bn respectively. The employment figure is 1,300 below the baseline and the associated output £130m less. The downstream expenditure of less than £482m is £240m below the baseline and the associated employment of 5,275 some 2,600 lower. Overall, the total FTE jobs figure of 15,900 is 3,925 below the baseline figure. The reasons for the decline are that there is

a substantial loss of higher paid shipbuilding jobs and no compensating increase from base-porting additional ships in Portsmouth.

Table 6.3: Outcomes from Scenario 3

Sector	(A) Direct FTE jobs	(B) Output from direct jobs £million	(C) Downstream output £million	(D) FTE jobs from downstream output	Total FTE jobs A+D	Jobs change from baseline
Primary products	-	0.0	2.3	25	25	--
Manufacturing	725	71.7	95.2	650	1,375	-2,400
Construction	425	49.4	39.4	325	750	-225
Retail & wholesale	75	5.2	41.0	650	725	-150
Hotel and catering	75	5.4	26.4	425	500	-75
Transport telecom and vehicle repairs	625	68.5	62.1	600	1,225	-225
Financial and business services	2,525	109.4	154.3	1,650	4,175	-975
Public sector	5,825	491.2	38.7	675	6,500	225
Cultural and other services	325	27.3	22.5	300	625	-100
Total	10,600	828.1	481.9	5,300	15,900	-3,925

Note: All employment figures are rounded to the nearest 25, output figures to the nearest £100,000

6.4 Scenario impacts compared

From the perspective of obtaining an overall picture of the potential impact of each of the three scenarios, it is illuminating to consider the results of the analysis from four different perspectives.

- The number of direct FTE jobs,
- Total output resultant from the Naval Base,
- Total FTE employment resultant from the Naval Base, and
- Proportional change in output and employment from the baseline position

It is evident from Figure 6.1, that scenario 1 produces an increase of over 2,500 direct FTE Naval Base jobs compared with the current baseline figure. Most of this is from additional ships' crew (the red block). Scenario 2 also shows a modest fillip, with the additional ships' crew offsetting the decrease in shipbuilding jobs. Scenario 3 illustrates how decline sets in if additional elements of the fleet do not transfer to Portsmouth. In this case the number of direct jobs falls by 1,300.

Figure 6.1 Number of direct FTE jobs under different scenarios

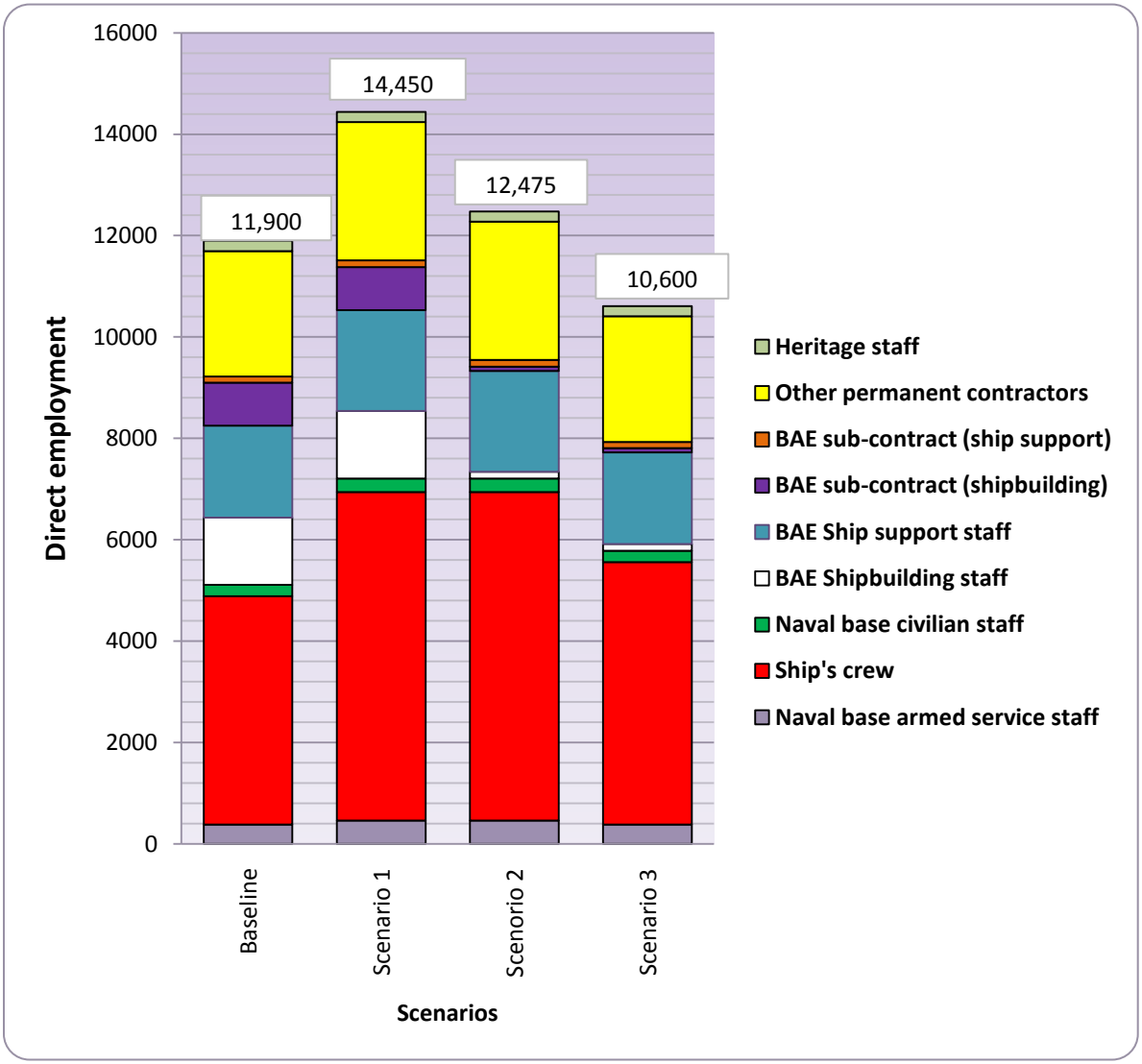


Figure 6.2 shows the total output in millions of pounds in each of the scenarios. The red section of the bar represents the output from direct employment at the base while the yellow segment constitutes the downstream effect of first round expenditure and subsequent induced and indirect effects. It is evident that output in Scenarios 2 and 3 is substantially lower than in Scenario 1 and also below the baseline level. This negative outcome is a consequence of shipbuilding moving away from Portsmouth thereby reducing both direct and downstream output.

Figure 6.2: Total output originating from the Naval Base under different scenarios

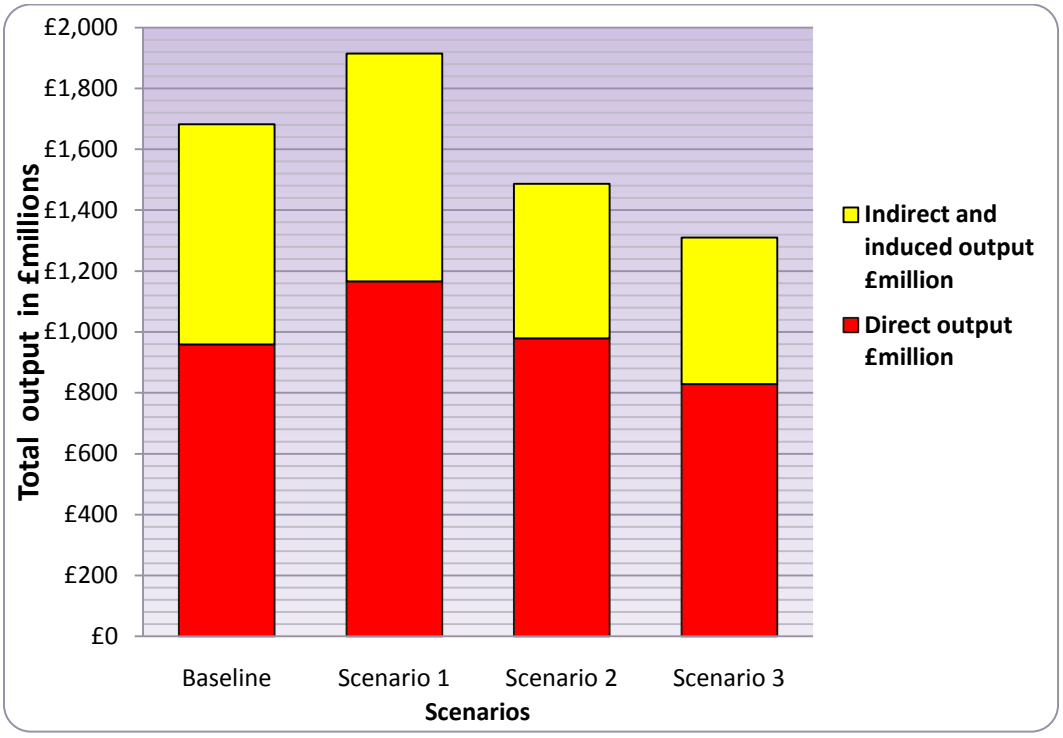


Figure 6.3: Total FTE employment resultant from the Naval Base under different scenarios

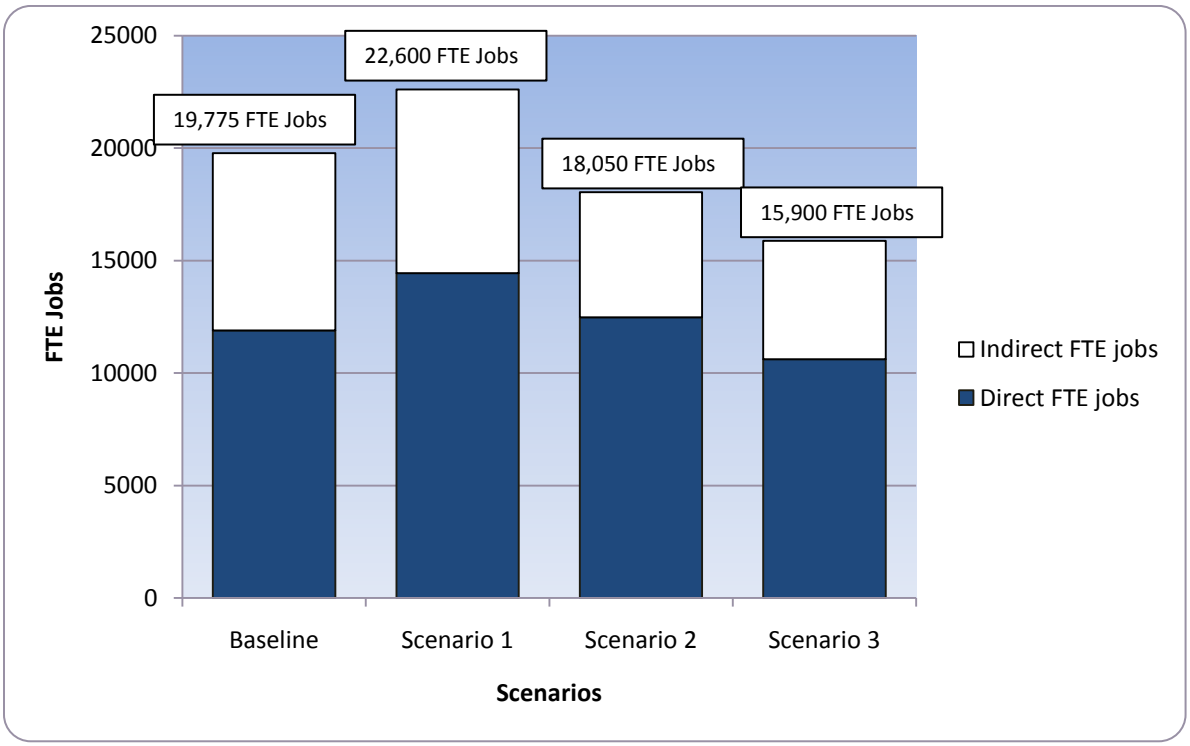
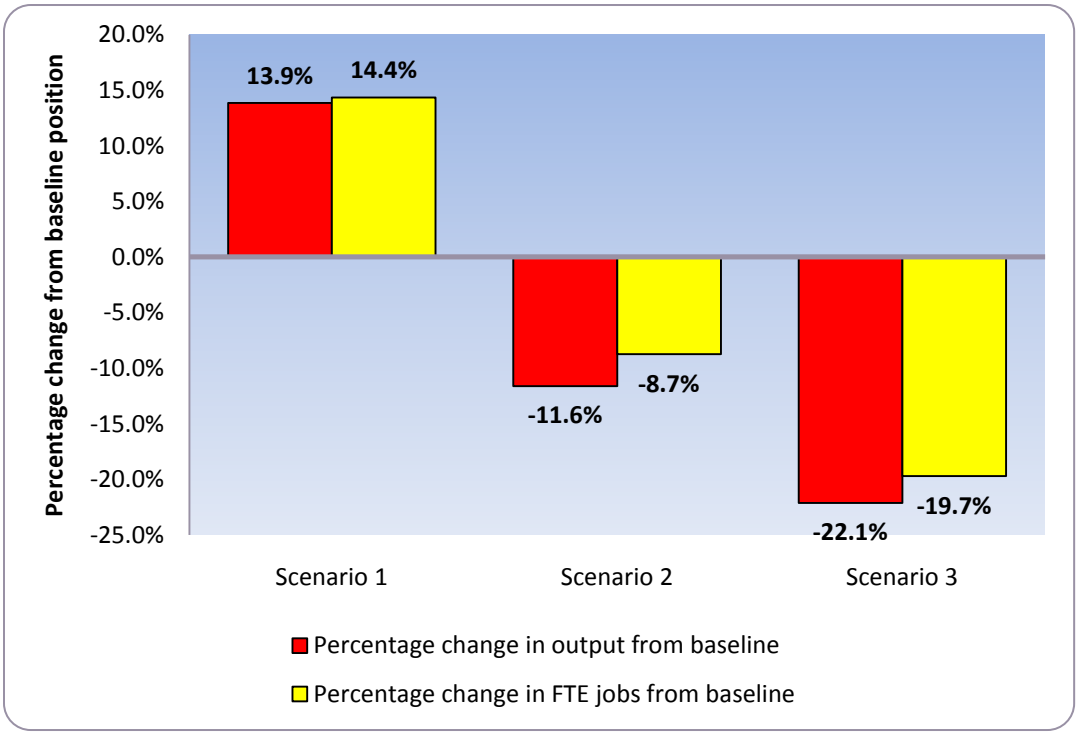


Figure 6.3 shows the total number of jobs under each scenario benchmarked against the current baseline position. The blue portion of each column represents the direct FTE jobs within the base itself and the white portion the downstream jobs elsewhere in the local economy resulting from the first round, induced and indirect effects of Base expenditures. It is clear that only Scenario 1 exceeds the current baseline position.

Figure 6.4, the final one in this series, shows the percentage change in jobs and output for each scenario compared with the baseline position. The red column depicts the change in output and the yellow column the change in FTE employment. In the most optimistic scenario both output and employment increase by around 14 per cent. In Scenarios 2 and 3 the output decrease exceeds that of the FTE jobs decrease. The reason for this is that the relatively wage and value-added output of jobs being lost is higher than those that replace them.

Figure 6.4: Proportional change in output and employment from the baseline position

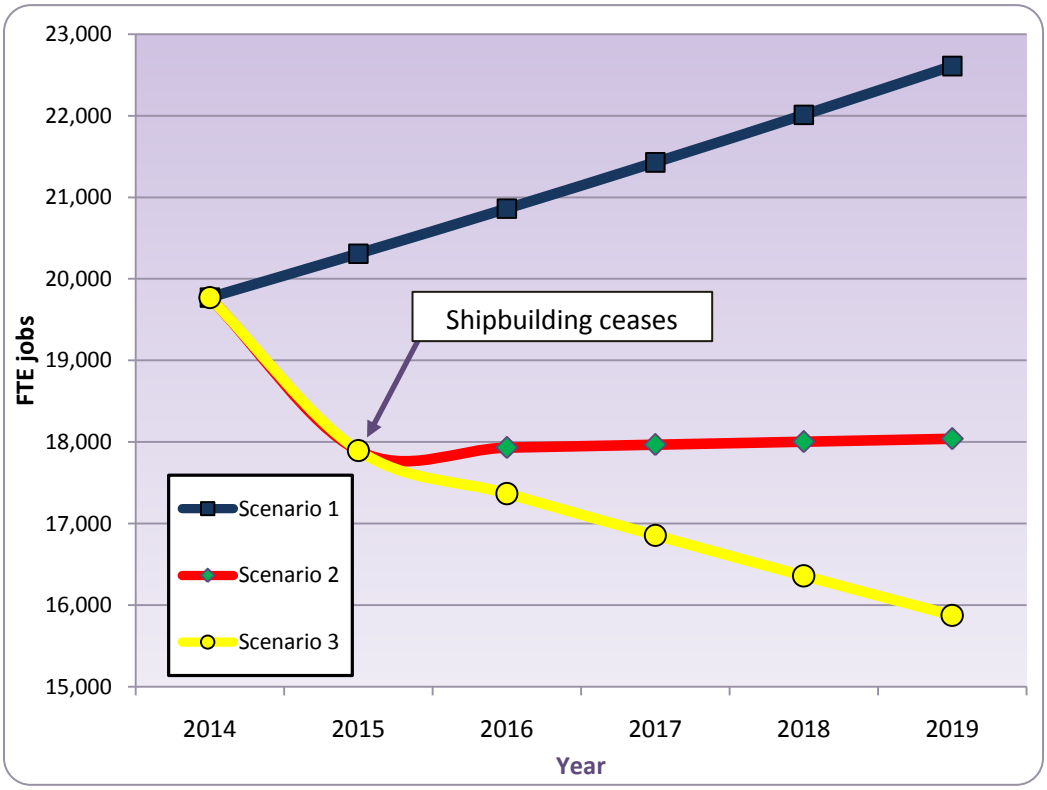


The time path of any expansion or reduction is assumed to be about five years,[69] commencing in 2014. It is probable that any transition would be 'lumpy', with, for instance, a sudden drop in shipbuilding in 2015 as the QE class carrier work starts to wind down (or it might be more

[69] This is the same assumption as used in a 2009 study of the potential rundown of HMS Sultan, in Gosport, if the move to a tri-service facility at St Athan in South Wales had been completed.

gradual as ships redeploy and other services contract). Figure 6.5 shows an indicative path of change. For Scenario 1 there is a smooth increase as ships move from Devonport and additional staff are taken on. For Scenario 2 there is a sudden drop off in shipbuilding activity and a more gradual increase associated with additional ships coming to Portsmouth. In Scenario 3 there is the sudden reduction in shipbuilding, followed by a more gradual reduction as the downstream jobs associated with that spending are shed.

Figure 6.5: Indicative time paths of change in FTE jobs over different scenarios



6.5: Additional considerations

The analysis above does not take into account the effect that a full or partial closure of the Naval Base might have on other elements of the local defence industrial base or co-located command, support and training establishments. However, the impact is likely to be significant, as witnessed by the closures at Portland and Chatham.

In the previous 2007 analysis of the impact of Portsmouth Naval Base, which examined a transfer of the surface fleet and associated activity (but retention of shipbuilding), the estimated

loss of over 11,300 direct FTE jobs at the base resulted in a further 10,300 FTE jobs lost at other bases and through the multiplier effect[70]. Clearly, the closure of the Base at Portsmouth would have knock-on effects that given the limited scope of the current study can only be guessed at. It can, however, be assumed that the impact would be significant. BAE alone has an additional 1,150+ jobs within the LEP area and the Royal Navy a further 5,150 on shore bases or with other organisations within the Naval Base. Under a full or partial closure scenario these would be at risk.

In Scenarios two and three the major direct impact on employment is likely to be the potential loss of jobs in shipbuilding. Therefore the question is how might this impact on the local labour market, in terms of the skills likely to be released? A 2004 study examining skills in the marine and engineering sectors,[71] identified a list of 46 different trades connected with shipbuilding. The most prevalent of these are the craft occupations such as pipe fitter, metal working production and maintenance fitters, metal plate workers and shipwrights, sheet metal workers and electricians. In addition there are significant numbers of professional and technical staff. A full listing is presented in Appendix 4. However, it does not mean that these will actually be released. For instance, the skills profile of the BAE operation in Portsmouth may not be typical of the industry average and as Tomaney et al found, the most skilled and motivated workers are also those most likely to move to another location in search of work[72].

The other aspect not examined in this report is what might happen to the estate of the Naval Base and other MoD sites if a closure programme occurred. The slow rate of economic absorption of redundant MoD establishments suggests it would be some considerable time before they were brought into economic use[73]. An alternative in the short-run might be to locate other sections of the armed services within the base, following the planned drawdowns from Germany and Afghanistan. However, to establish an insight into the effects of a full or partial closure more research would be required than undertaken in the current study. This would include establishing a baseline of all establishments that might potentially be under threat.

[70] 3,700 of these FTE jobs were direct jobs at associated establishments no figure were calculated for the co-located defence industrial base.
[71] The 2004 Marine and Engineering Skills Survey by the University of Portsmouth used a matrix of industrial sectors and standard occupational classifications, drawn from the Labour Force Survey, to identify typical industrial skill sets.
[72] Tomaney J, Pike A and Cornford J, 1999, Plant Closure and the local economy: The case of Swan Hunter on Tyneside, Regional Studies, Vol 33 Number 5, p401.
[73] HMS Vernon commenced its slow demise in 1987 and did not open as Gunwharf Quays until 2001: HMS Daedalus, in Gosport, was closed in 1996, it took a further 8 years for the MoD to declare it surplus to requirements and another 2 years before SEEDA acquired it and started preparing a development plan, it was named as an enterprise zone in 2011, 15 years after the ceasing military use.

7. Conclusions

The findings of the report clearly highlight the importance of the Portsmouth Naval Base to the LEP local economy. The activities within the Base, in conjunction with downstream multiplier effects through the defence supply chain and household expenditures, are estimated to produce more than £1.68bn of economic output. They also support almost 19,800 jobs throughout the LEP area economy. In total, the activities at the facility represent almost 3.5 per cent of LEP area output and 4.1 per cent of all FTE jobs. For specific sectors it is even more important, supporting almost 70 per cent of shipbuilding jobs, 27 per cent in Facilities management and 14 per cent of Public administration and defence jobs.

The base itself provides employment for an estimated 11,900 people, 60 per cent of whom are civilian employees working for a raft of defence dependant companies and directly for the MoD. Of these it is estimated that almost 77 per cent live within the LEP area. There are also a significant number of jobs associated with other defence companies and local Royal Naval and other MoD establishments.

On the basis of the assumptions embedded in the three different scenarios, the outcomes range from a significant expansion of activity at the Base to a significant reduction in capacity. Hence it is estimated that the employment possibilities cover a wide spectrum from an increase of 2,825 FTE jobs to a contraction of 3,875 FTE jobs. What is also clear is that the brunt of any change would impact upon the urban areas of South Hampshire, where most of the current workforce resides. However, because of the multiplier effect the impact would be felt across almost all sectors of the LEP economy. Thus any change that impacts directly on the Base is likely to have consequences throughout the LEP area, even in sectors that are not commercially connected to the facility.

Appendices:

Appendix 1

Explanatory notes to flowchart on page 23 outlining the modelling process used to analyse the economic impact of the Portsmouth Naval Base on the Solent LEP economy

The flowchart initially sets out the stages in the formulation of the baseline impact of the Portsmouth Naval Base which is located within the Solent LEP economy. This puts into context, and allows comparisons to be made with, the results from the scenario building and input-output analysis which help to model future expected employment and expenditure levels following changes which may affect the Base in the near future.

1. The Naval Base directly employs both service and civilian personnel. These employees may be permanent residents, or may live 'on base' only when their ship is in port. Some employees may live outside of the LEP area, and commute daily to the Base.

2. The facility and co-located companies, source some of the supplies and services that they require within the local economy and when this occurs, this expenditure accrues directly to local companies. Where a particular industry sector is absent from the local economy, products or services have to be imported from outside of the area, and the related expenditure "leaks" out. Firms within the LEP area that supply the Naval Base will inevitably need to restock and may potentially purchase their input materials from other local businesses. In this way, the indirect economic effect of the Naval Base ripples through the local economy. This is called the 'multiplier effect;' its size will again depend upon the ability of the local economy to meet and supply the needs of the firms within it.

3. Permanent LEP area residents are assumed to spend, wherever possible, all their disposable income in the local economy. Ships' crew with addresses outside the area are assumed to spend at the same daily rate as tourists (excluding accommodation) when in port. Visitors to the heritage site and visiting ships' crew are also assumed to spend in a similar pattern to tourists. Commuters into the Naval Base are assumed to have a fixed daily expenditure of £6 per head within the local economy.

4. In reality, the amount that residents spend in the LEP area will be constrained by the size and structure of the local economy. If a particular sector is either not present or under-represented, consumers will import goods and services from elsewhere, leading to further "leakages" from the local economy. Primary spending in the local economy, will lead to so-called induced economic effects, as the money is re-circulated through the economy via the employment provided by local businesses and through the expenditure both of the businesses themselves, and their employees.

5. A simulation model is constructed into which scenarios regarding the future outcomes for the Naval Base, devised on the basis of the available information, can be fed. This model produces estimates of the likely changes in direct consumer and supplier spending as a result of any future restructuring of the facility.

6. The baseline and post-scenario expenditures are fed into the Solent LEP input output model which simulates the indirect and induced economic effect of the Naval Base.

The results from the input-output model and from the aggregated post scenario tables are combined with the baseline model to evaluate the overall impact (direct, indirect and induced) of the Base on the LEP area economy.

Appendix 2. Listing of identifiable local companies who are part of the ADS Group (formally Defence Manufacturers Association)

Name	Location
Succinct Solutions	Eastleigh
Aspen International Ltd	Fareham
Barnbrook Systems Limited	Fareham
BMT Reliability Consultants	Fareham
Chemring Group Plc	Fareham
Meggit Avionics	Fareham
Northrop Grumman	Fareham
Microturbo	Fareham
QinetiQ GRC Ltd	Gosport
STS Defence Ltd	Gosport
Vector Aerospace Helicopter Services	Gosport
ESL Defence Ltd	Hamble
Fischer Connectors Ltd	Havant
Lockheed Martin	Havant
Britten-Norman	IOW
Rolatube Technology	Lymington
BAE SYSTEMS maritime	Portsmouth
Chemring Marine Limited	Portsmouth
Nightsearcher Ltd	Portsmouth
Pall Aerospace	Portsmouth
Portsmouth Aviation Ltd	Portsmouth
Ramora Global Ltd	Portsmouth
Astrium	Portsmouth
Serco Denholm Ltd	Portsmouth
Cunning Running Software Ltd	Romsey
DMS Technologies	Romsey
Roke Manor Research Limited	Romsey
RJD Technology Ltd	Rowlands Castle
Guartel Technologies Ltd	Totton
Polaris Consulting Ltd	Waterlooville

Source: ADS website at http://www.adsgroup.org.uk/

Appendix 3: Percentage change in employment and spending, when compared with the baseline, under the different scenarios presented within the report

	Ships' crew	Naval Base armed service	Naval Base civilians	Shipbuilding inc permanent contractors	Maritime Services inc permanent contractors	Other contractors	Heritage area	Visiting ships' crews	Commuters	Supplies and services
Scenario 1: Shipbuilding continues and additional ships move to Portsmouth										
Employment	+44%	+20%	+20%	0%	+10%	+10%	0%			
Spending	+34%	+10%	+10%	0%	+5%	+5%	+25%	+10%	+7%	0%
Scenario 2: Additional ships move to Portsmouth but shipbuilding ceases										
Employment	+44%	+20%	+20%	-90%	+10%	+10%	0%			
Spending	+34%	+10%	+10%	-70%	+5%	+5%	+25%	+10%	-11%	-45%
Scenario 3: Current fleet remain at Portsmouth and shipbuilding ceases										
Employment	+15%	0%	0%	-90%	0%	0%	0%			
Spending	+10%	0%	0%	-70%	0%	0%	0%	0%	-17%	-45%

Source: Based on analysis contained within the current report

Note: 0% = no change

Appendix 4: Composition of shipbuilding employment by occupation

Occupations	Percentage of total employment	Occupations	Percentage of total employment
Production works & maintenance managers	1.39%	Sheet metal workers	6.79%
Financial managers & directors	1.50%	Metal plate workers, shipwrights, riveters	4.03%
Marketing and sales managers	1.04%	Welding trades	1.51%
Office managers	1.40%	Pipe fitters	8.70%
Storage and warehouse managers	1.40%	Metal working production & maintenance fitter	7.34%
Security managers	1.10%	Motor mechanics auto engineers	1.66%
Managers and administrators	**7.85%**	Electricians electrical fitters	6.53%
Mechanical engineers	2.47%	Steel erectors	1.37%
Electrical engineers	1.38%	Carpenters and joiners	0.93%
Electronics engineers	1.49%	Painters and decorators	2.87%
Engineering professionals n.e.c.	1.49%	**Craft and related**	**41.73%**
Software professionals	1.37%	Customer care occupations	1.20%
Management consultants & business analysts	1.14%	**Sales occupations**	**1.20%**
Public service administrative professionals	1.13%	Plastics process operatives	1.21%
Professional occupations	**10.47%**	Quarry workers and related operatives	1.80%
Laboratory technicians	1.87%	Metal working machine operatives	1.58%
Engineering technicians	3.21%	Routine inspectors and testers	1.31%
Draughtspersons	1.81%	Assemblers and routine operatives nec.	1.31%
IT operations technicians	1.21%	Crane drivers	2.75%
Fire service officers (leading officers & below)	1.29%	**Plant and machine operatives**	**9.97%**
Ship and hovercraft officers	1.55%	Stevadores dockers and slingers	1.66%
Buyers and purchasing officers	2.51%	Other good handling & storage occupations nec	2.09%
Associate professional & technical	**13.45%**	Security guards and related occupations	1.66%
Accounts wages clerk bookkeeper	2.54%	**Other occupations**	**5.40%**
Filing & other records assistants & clerks	1.25%		
Stock control clerks	1.12%		
Transport and distribution clerks	1.12%		
General office assistants or clerks	1.33%		
Personal assists & other secretaries	2.56%		
Clerical and secretarial	**9.93%**		

Source: Marine and Engineering Skills Survey 2004.