Cost Comparison Analysis of Army Regular and Reserve Sub-Units

Aim

1. This paper sets out the method, assumptions and findings generated from the cost comparison analysis of Army Regular and Reserve Sub-Units undertaken for MOD Reserve Forces and Cadets (RF&C).

Introduction

2. Dstl was tasked by RF&C to conduct a cost comparison analysis of five types of Army Regular and Reserve Sub-Units. This analysis was to identify the cost of ownership and use of these Sub-Units, enabling cost differentials between the Regulars and Reserves to be better understood.

3. Previous cost comparison analysis undertaken by Dstl centred on understanding personnel cost differentials in ownership and use of a Light Infantry Company. This analysis has been exploited and built upon to include the addition of elements of Training and Infrastructure costs for the following cases:

a) Light Infantry Company;
b) Armoured Squadron;
c) Multiple Launch Rocket System (MLRS) Battery;
d) Royal Logistics Corps (RLC) Close Support Squadron;
e) Royal Signals Information & Communication Systems (ICS) Squadron 2.

4. It is recognised that in order to deliver the same deployed time over a sustained period two Reserve Sub-Units are required for each Regular Sub-Unit. This is driven by Regular service personnel being able to **deploy** for a total of one year in five[1], whereas Reserve service personnel **mobilise** for one year in five, including a single six month deployment. Therefore to enable a fair comparison for a "deployed year" two Reserve Sub-Units (one deployed and one non-deployed) must be compared to a single Regular Sub-Unit[2], an underlying assumption which supports the analysis throughout the paper. A further cost comparison of a single Reserve Sub-Unit to a single Regular Sub-Unit has also been made, where it is assumed both Sub-Units will undertake a one-off deployment during a five year period.

Caveats

5. The figures provided within this document, for cost of ownership and use of Regular and Reserve Sub-Units, should not be used for budgetary purposes. Instead they give the relative cost difference of owning and using Regulars and Reserves under current assumptions.

6. Whilst this paper highlights the relative cost difference between Regular and Reserve Sub-Units, no effort has been made to investigate their relative effectiveness on operations as a function of both different training standards and readiness states.

7. Three point cost estimates for Regular and Reserve Sub-Units have been developed in this analysis to allow for uncertainty in the data to be considered. The use of three point estimates is a standard method used in cost estimation and comparison.

[1] A six month tour every 30 months as per Defence Strategic Direction 13.
[2] However it should be noted that both Reserve Units are at different points in their FORM cycle, the impact of this is explained in paragraph 18.

Key Findings

8. When the Reserves are used on an enduring basis, two Reserve Sub-Units have been compared with a single Regular Sub-Unit throughout the cost comparison. This analysis illustrates that:

a) Two Reserve Sub-Units are less expensive than a single Regular Sub-Unit when not deployed (26-51% of the cost);

b) Two Reserve Sub-Units are generally more expensive than a single Regular Sub-Unit when deployed (85-155% of the cost);

c) When assuming the most stressing deployment pattern[3] (i.e. the most expensive), two Reserve Sub-Units are less expensive than a single Regular Sub-Unit (45-88% of the cost).

9. When assuming a one-off mobilisation during a five year period, the costs of a single Reserve Sub-Unit have been compared with that of a single Regular Sub-Unit. The cost comparison (table 3) shows that:

a) When deployed, a Reserve Sub-Unit is broadly comparable to, if not less expensive than a Regular Sub-Unit (69-125% of the cost);

b) When not deployed a Reserve Sub-Unit is less expensive than a Regular Sub-Unit (13-25% of the cost).

<u>Comparing relative costs of two Reserve Sub-Units with one Regular Sub-Unit</u>

10. Table 1 provides more detail when comparing the relative cost of two Reserve Sub-Units compared to a single Regular Sub-Unit. For example, two Reserve Light Infantry Companies are between 31-50% of the cost of one Regular Light Infantry Company when not deployed and between 93-155% when deployed. Upper and lower bounds of the overall ranges have been highlighted in bold.

	Non Deployment Year (Own)			**Deployment Year (Use)**		
	Minimum	Most Likely	Maximum	Minimum	Most Likely	Maximum
Light Infantry Coy	31%	40%	50%	93%	122%	**155%**
Armoured Sqn	**26%**	32%	40%	90%	116%	146%
MLRS Bty	29%	37%	46%	93%	120%	152%
RLC Sqn	30%	40%	50%	**85%**	113%	145%
Signal Sqn	31%	41%	**51%**	89%	116%	147%

Table 1 – Relative cost of two Reserve Sub-Units compared with a single Regular Sub-Unit

11. The results above represent single year snapshots for a non-deployment year and a deployment year. However, the maximum a Regular unit can be deployed for is one year in five and Reservists one year in ten (as per paragraph 4). Therefore a weighted average has been produced to represent the most expensive scenario for Reservists compared to Regulars, i.e. Reservists mobilise for one year in every five. Again two Reserve Sub-Units are compared with a single Regular Sub-Unit to ensure comparable deployed time.

12. Table 2 below identifies the weighted average cost for each of the case studies. It shows that even for the most stressing deployment frequency, two Reserve Sub-Units are between 45-88% as expensive as a single Regular Sub-Unit.

[3] Deploying one year in five for Regulars and one in ten for Reserves.

	Weighted Average		
	Minimum	Most Likely	Maximum
Light Infantry Coy	53%	70%	**88%**
Armoured Sqn	**45%**	57%	71%
MLRS Bty	51%	65%	82%
RLC Sqn	52%	68%	87%
Signal Sqn	53%	69%	87%

Table 2 – Relative cost of two Reserve Sub-Units compared with a single Regular Sub-Unit for a weighted average year

13. Within these costs it is important to understand what is driving the estimates. Figure 1 below illustrates the breakdown of the cost of a Light Infantry Sub-Unit by DLoD[4], in a non-deployment year, deployment year and weighted average year. The proportion of each DLoD element broadly reads across to the other case studies which can be found within the results section of this paper.

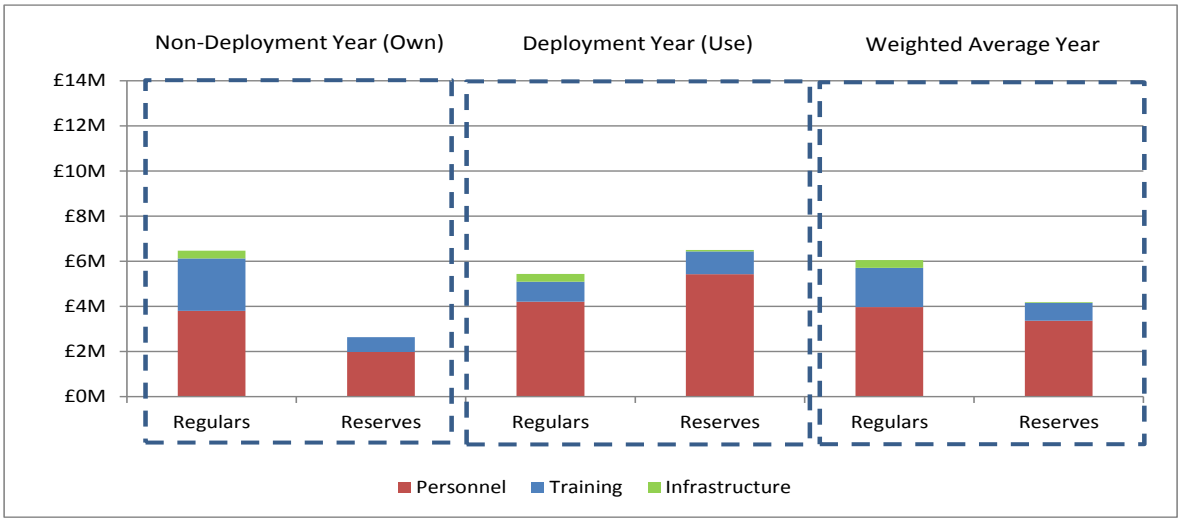

Figure 1 – Cost drivers, Light Infantry Company example comparing two Reserve Sub-Units with a single Regular Sub-Unit

14. The analysis has shown that Reservists are less expensive when not deployed. This is principally driven through the requirement to only pay Reservists when they train, the lower consumption of training consumables and the lack of a requirement to provide subsidised accommodation. When deployed, Reservists are more expensive because of the additional pay cost incurred (Reservist Award) and the requirement to have two Sub-Units to deliver the same deployed time as one Regular Unit. However, overall Reservists are less expensive as a result of current assumptions which drive the proportion of deployed to non-deployed time[5].

<u>Comparing relative costs of one Reserve Sub-Unit with one Regular Sub-Unit</u>

15. Table 3 below provides more detail when comparing the relative cost of one Reserve Sub-Unit to one Regular Sub-Unit. The table shows a simple one year snapshot for each of the case studies in the non-deployment and deployment use cases. For example, one Reserve Light Infantry Company is between 16-25% of the cost of one Regular Light Infantry Company when not deployed and between 74-125% when deployed. Upper and lower bounds of the overall ranges have been highlighted in bold.

[4] Defence Line of Development.
[5] As per paragraph 4.

Sub-Unit	Non-Deployment Year (Own)			Deployment Year (Use)		
	Minimum	**Most Likely**	**Maximum**	**Minimum**	**Most Likely**	**Maximum**
Lt Inf Coy	16%	20%	**25%**	74%	98%	**125%**
Armd Sqn	**13%**	16%	20%	70%	90%	113%
MLRS Bty	15%	19%	23%	74%	96%	122%
RLC CS Sqn	15%	20%	**25%**	**69%**	92%	119%
Sigs ICS Sqn 2	16%	20%	**25%**	71%	94%	119%

Table 3 – One to one comparison of a single Reserve Sub-Unit with a single Regular Sub-Unit, assuming a one-off six month deployment during a five year period

Methodology

16. **General Method**. A standardised costing method in accordance with JSP 507 (Investment Appraisal and Evaluation v6.0 January 2014) has been used as the basis for this analysis. All results have been rounded to one decimal place. Annex A provides further detail on costing assumptions.

17. A cost resource breakdown structure was identified at the outset of this work. This sought to identify the major cost drivers and differentials between Regulars and Reserves. The identified elements by DLoD considered in this analysis are shown in Table 4 below.

DLoD	Regular Non-Deployment (Own)	Regular Deployment (Use)	Reserve Non-Deployment (Own)	Reserve Deployment (Use)
Personnel	Basic Pay	Basic Pay	Basic Pay	Basic Pay
	ERNIC[6]	ERNIC	ERNIC	ERNIC
	SCAPE[7]	SCAPE	SCAPE	SCAPE
	Allowances	Allowances	Allowances	Allowances
			Working Time Directive	
			Bounty	
				Reservist Award
Infrastructure	SFA	SFA		
	SLA	SLA		SLA
Training	Equipment running costs	Equipment running costs	Equipment running costs	Equipment running costs
	Fuel	Fuel	Fuel	Fuel
	Ammo	Ammo	Ammo	Ammo
			RTMC Chilwell	RTMC Chilwell

Table 4 – Cost resource breakdown structure

18. It should be noted that whilst comparable Regular and Reserve Sub-Units exist for Light Infantry, Armoured and Artillery no such comparison can be made for Signals and Logistics. Therefore in these cases the Regular Sub-Unit structure has been assumed for the Reserve Sub-Units to ensure a fair cost comparison.

[6] Earnings Related National Insurance Contributions.
[7] Superannuation Contribution Adjusted for Past Experience.

19. To deliver comparable deployed time over a sustained period it is necessary to compare two Reserve Sub-Units with a single Regular Sub-Unit. Table 5 illustrates a deployment profile of Regular and Reserve Sub-Units showing Non-Deployment (N), Pre-Deployment Training (PDT) and Deployment (Dep). This table demonstrates the method used to enable a fair comparison to be made; it should be noted that other Sub-Units will be part of the deployment cycle.

	Deployment Year (Use)		Non-Deployment time (Own)			Deployment Year (Use)		Non-Deployment time (Own)		
Roule	1	2	3	4	5	6	7	8	9	10
Regular Sub-Unit	PDT	Dep	N	N	N	PDT	Dep	N	N	N
Reserve Sub-Unit 1	PDT	Dep	N	N	N	N	N	N	N	N
Reserve Sub-Unit 2	N	N	N	N	N	PDT	Dep	N	N	N

Table 5 – Illustrative FORM cycle

20. This cycle leads to three types of year, these are explained below:

a) Non-deployment year (Ownership) – A full working year of training is assumed for Regulars with a standard number of Man Training Days (MTDs) assumed for Reservists.

b) Deployment year (Use) – a six month deployment, four months pre deployment training and two months leave are assumed for Regulars. A six month deployment, three months pre deployment training and two months leave for Reservists have been assumed and costs scaled to represent a comparable year (paragraph 22 refers).

c) Weighted average year – within a five year period[8] a Regular Sub-Unit will incur two deployment years (two times six month deployments) and three non-deployment years. A Reserve Sub-Unit incurs one deployment year in five (paragraph 4 refers) and four non-deployment years. The weighted average is a single figure representing a five year average cost for Regular and Reserve Sub-Units respectively.

21. **Personnel Costs Method**. Capitation Rates for each Regular, Reserve and Called-Out Reserve rank in each of the five Sub-Units types has been calculated from Financial Year (FY) 2012/13 Joint Personnel Administration (JPA) data. A review of the JPA data has been conducted and it is assessed that the main personnel cost drivers are included in the capitation rates. A capitation rate breakdown is provided at Annex B.

22. Capitation Rates for Non Regular Permanent Staff (NRPS) have been calculated and attributed to NRPS ranks within the Reserve only.

23. It was observed that salary costs for Called-Out Reservists within the JPA data reflect an eleven month mobilisation. These have been adjusted to represent a full twelve month deployment year to ensure parity with the Regulars. Whilst it is recognised that the eleven month mobilisation is the current convention, twelve months represents the maximum allowed for under the Reserve Forces Act 1996.

24. Reservist Award has been calculated by rank and Arm from the FY 2012/13 data; this ensures a fair representation of the award is made based on the demographic and type of civilian employment of Reservists in each Arm.

[8] Defence Strategic Direction defines policy on how often a serviceperson is to deploy. Currently this is set at one in five years. Therefore a five year period has been used for analysis to compare how many Non-deployment years are required for each deployment year. This enables an average cost to be generated.

25. Under FR20 Reservists will receive pensions. An adjustment to the capitation rate has been made to represent this using the same proportions of basic pay to pension for Regulars. Annex B provides further detail.

26. **Infrastructure Costs Method**. It was assessed that the additional cost to MOD of leasing and maintaining Service Families Accommodation (SFA) and Single Living Accommodation (SLA) for Regular service personnel was the key infrastructure cost differential. Data on this additional cost to MOD has been sourced from the Defence Infrastructure Organisation (DIO) Living Accommodation Strategy Review (LASR)[9].

27. An average Net cost (cost minus income) per serviceperson across the Army housed in service accommodation has been calculated by summing the rental, maintenance and lifecycle replacement cost minus the receipts paid by service personnel.

28. Take-up rates for SLA/SFA have been calculated in accordance with the LASR paper. These were then used to determine the average accommodation cost for a Sub-Unit.

29. **Training Costs Method.** The Dstl Training Cost Model (TCM) has been used to provide the cost data for the analysis. The primary driver for the development of the TCM was the Defence Training Systems Infrastructure Change Programme (DTSICP), with the aim being to understand the total cost of training to defence and to identify the key training cost drivers[10].

30. The TCM is based on the Dstl Force Structure Cost Model (FSCM), which is a high level tool used to identify key cost drivers in defence and thus quickly evaluate the cost implications of alternative force structures. The FSCM is widely used throughout defence, and has been identified as one of the key tools in support of the forthcoming Strategic Defence and Security Review (SDSR) 2015.

31. The TCM however does not differentiate between Regular and Reserve Sub-Units. Therefore to apportion the training cost fairly, a standard metric of training days within a deployment and non-deployment year for both Regular and Reserve Sub-Units has been used. The quantity of training days assumed for Regulars and Reserves for this apportionment can be found at Annex D.

Assumptions and exclusions

32. Several key assumptions and exclusions have been made in the course of this analysis. These are summarised below with more detailed assumptions provided at Annexes A-D.

a) Only costs that are specific to either a Reserve or Regular Sub-Unit have been included, no attempt has been made to apportion overheads such as Army HQ. These costs are assumed fixed and would not vary with changes to a specific Sub-Unit, any inclusion of such costs would give a misleading result.

b) Transitional costs incurred through Army 2020 or Future Reserves 2020 have been excluded.

c) All costs are at constant FY 2012/13 economic conditions.

d) No distinction has been made between the cost borne by MOD and the Net Additional Cost of Military Operations (NACMO).

[9] D/DIO(Sec)5/3, Living Accommodation Strategy Review, D SAPT & D SP Pol, dated 18 February 2014 - RESTRICTED

[10] The development process involved a series of workshops with each of the Front Line Commands (FLCs) and further input from the DTSICP.

e) Only cash costs have been included within the analysis, non-cash costs such as depreciation have been excluded.

f) It is assumed that a single formed Sub-Unit can be generated for operations from within a Unit, with personnel from multiple Sub-Units backfilling gapped posts due to personnel being unable to deploy. These personnel are assumed to mobilise within the five year harmony cycle for another Sub-Unit.

g) Deployable Sub-Unit structures have been assumed as the same between Regular and Reserves. Reserve structures include Non-Regular Permanent Staff (NRPS) and Regular Permanent Staff.

h) It is assumed that the full manpower liabilities for both Regular and Reserve Sub-Units are met and fully equipped.

i) The analysis has been set in a steady state, i.e. assuming that the Regular and Reserve liabilities are filled. Recently announced recruitment and retention incentives have been excluded given the uncertainty into the levels of recruitment/retention required to maintain the force size in 2020.

j) Only trained strength has been considered.

k) The average capitation rates generated from a single years data are assumed to be a realistic figure for extrapolation i.e. the cost of Bounties awarded to Reservists is representative of a typical year.

l) Sub-Unit specific infrastructure costs have been sourced for Reserves however an equivalent for Regulars is not currently available. In discussion with DIO it is understood that identifying Regular Sub-Unit specific infrastructure running costs is not yet available but work in the area is currently underway. To include Reserve only costs would lead to an unfair comparison and therefore these have been excluded.

m) Equipment procurement costs have been excluded in this analysis, as agreed with Head RF&C.

33. The robustness of the main assumptions has been tested by analysing how sensitive the results are to specific changes, Annex E contains this sensitivity testing.

Uncertainty

34. There is a degree of uncertainty within the results. Therefore all costs are presented as three point estimates depicting the minimum, most likely and maximum value for each of the cost elements. This is principally driven through the necessity to use high level assumptions and uncertainty within the source data. These are further explained below:

a) Personnel – Data has been sourced from JPA and only represents a single year's snapshot. However the capitation rates have been compared at the high level with two additional years data (FY2010/11 and 2011/12) and have proven to be accurate within ±10%. Therefore these uncertainty bounds have been applied to the raw data to account for any variances in the demographics of those personnel called out, which drives the Reservist award[11].

[11] Called out Reserves are seen as an area of relative uncertainty as the size of this data set is far smaller than that of the Regulars and Reserves not called out.

b) Infrastructure – While the current levels and cost of SLA/SFA have been captured the contract for leasing SFA is due for review in 2021. Uncertainty has therefore been applied to account for any cost increases as a result of this review.

c) Training – The TCM has been used to provide the cost for each of the case studies, however high level assumptions have been made to apportion the costs between Regular and Reserve Sub-Units (using training days as a common metric). Policy specifies the expected training days commitment for Reserves, uncertainty of ±10% has therefore been applied to allow for deviations around this.

Red Teaming

35. According to the DCDC Red Teaming guide - "Red Teaming is the art of applying independent structured critical thinking and culturally sensitised alternative thinking from a variety of perspectives, to challenge assumptions and fully explore alternative outcomes, in order to reduce risks and increase opportunities."

36. Dstl presented the analysis, including the method, assumptions and results to Dstl military advisors and civilian analysts. The Red team exercise highlighted three main points:

a) If Reserve Sub-Units are to be of equal effectiveness to Regular Sub-Units then the costs may significantly change, i.e. they may require additional training – whilst this is noted, the current assumption is that Reserve Sub-Units do not need to be as effective as a Regular Sub-Unit.

b) The Reserves may not be able to mobilise sufficient personnel to efficiently form a Sub-Unit. This may lead to large generating forces and therefore could be costly - this assumption has subsequently been tested in Annex E to understand how sensitive the analysis is to changes in mobilisation rates.

c) Readiness has not been valued – while readiness has been inherently costed as Reserves are assumed to train to Collective Training Level 2 within peacetime conditions, this analysis is only looking at a cost comparison. Any attempt to conduct a cost effectiveness comparison will need to try and understand the value of Regulars held at higher readiness.

37. The Red Teaming exercise increased confidence in the analysis and has provided assurance that the method and assumptions are appropriate for conducting a cost comparison between Regular and Reserve Sub-Units.

Results

38. An important differential which drives the cost of Regulars and Reserves is the number of instances of deployment. Two cases have been modelled; the first reflects no deployment (least expensive) and the second reflects a maximum harmony compliant deployment (most expensive) in accordance with DSD13 and the Reserve Forces Act 1996 for Regular and Reserve Sub-Units respectively.

Sub-Unit	Relative cost – No deployments			Relative cost – Maximum deployments		
	Minimum	Most Likely	Maximum	Minimum	Most Likely	Maximum
Lt Inf Coy	31%	40%	50%	53%	70%	**88%**
Armd Sqn	**26%**	32%	40%	**45%**	57%	71%
MLRS Bty	29%	37%	46%	51%	65%	82%
RLC CS Sqn	30%	40%	50%	52%	68%	87%
Sigs ICS Sqn 2	31%	41%	**51%**	53%	69%	87%

Table 6 – Relative cost under different deployment assumptions of two Reserve Sub-Units with a single Regular Sub-Unit

39. Table 6 shows that in all deployment types the Reservist are less expensive than Regulars over an extended period (noting that in a deployment year they may be more expensive[12]). In all cases (apart from the Armd Sqn) the percentages are closely aligned; 26-51% for no deployments and 45-88% for maximum deployments.

40. In the case of the Armd Sqn the percentages are less in both instances. This is due to how training drives the overall cost of the estimate more for the Armd Sqn, as seen in Figure 2 which compares a single Regular and single Reserve Sub-Unit. The other four case studies are broadly comparable, and hence have similar ratios.

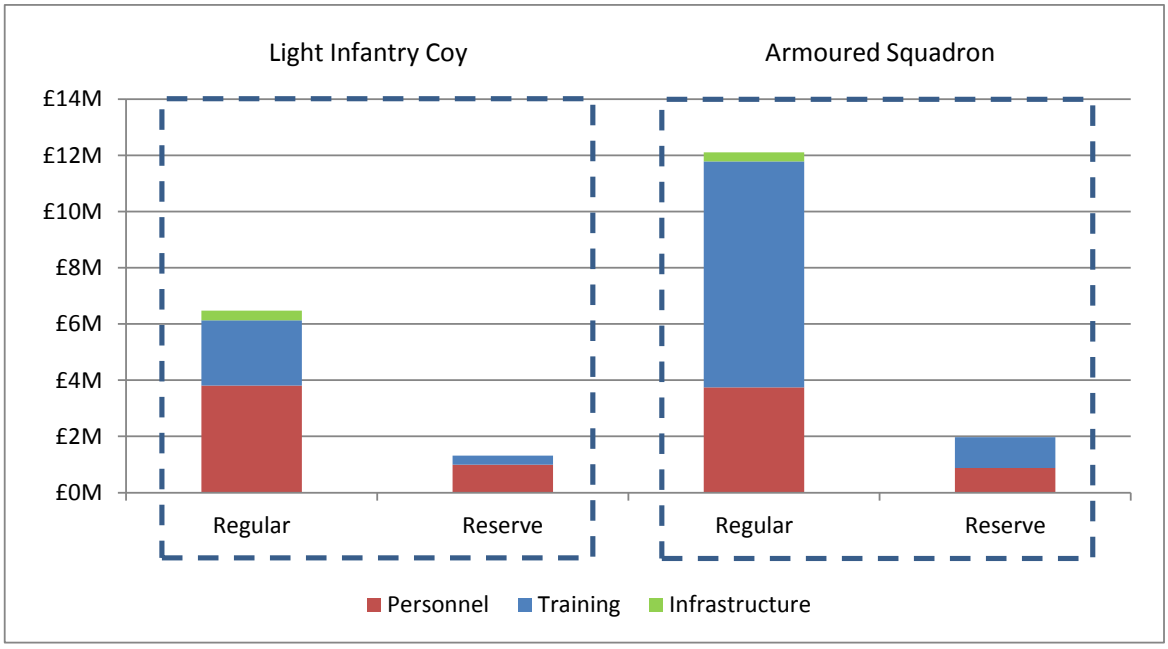

Figure 2 – Comparison of a Lt Inf Coy with an Armd Sqn in a non-deployment year (most likely)

41. Figure 3 below represents the in-year costs for two Reserve Lt Inf Coys, noting that both Sub-Units deliver the equivalent deployed time as a single Regular Lt Inf Coy – as demonstrated in Figure 4.

[12] To generate the same output two Reserve Sub-Units are required for each Regular Sub-Unit. As explained in paragraph 4.

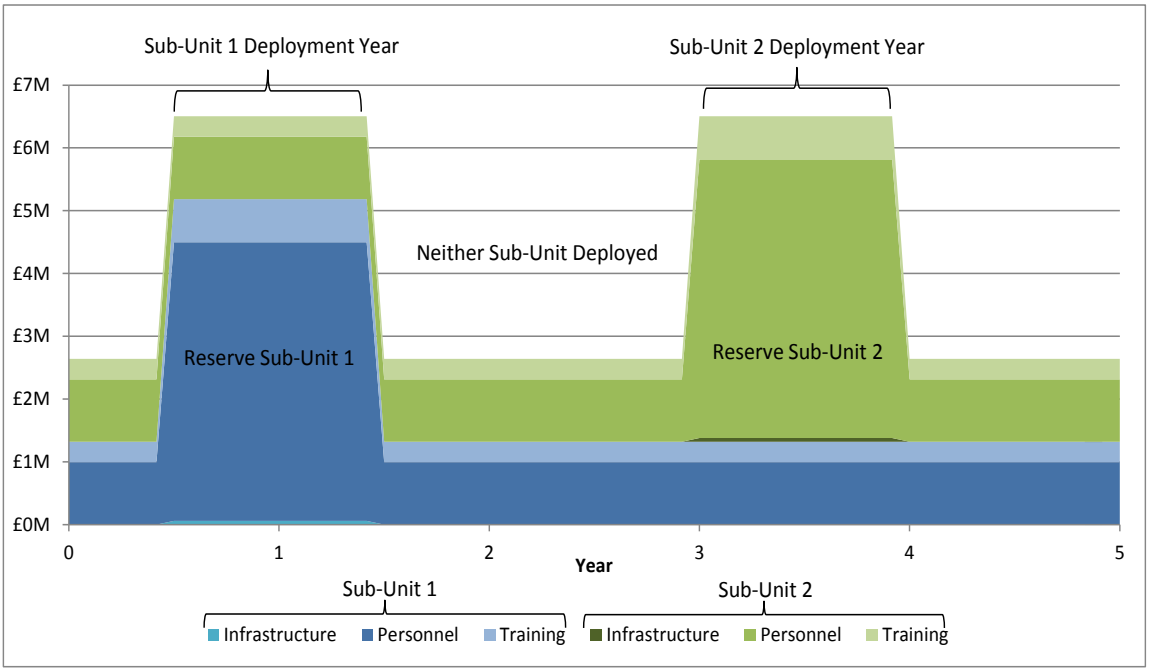

Figure 3 – In year costs of two Reserve Lt Inf Coys (most likely)

42. Figure 4 represents the in-year costs for a single Regular Lt Inf Coy. As per Figure 3 it represents a years deployed time over a five year period.

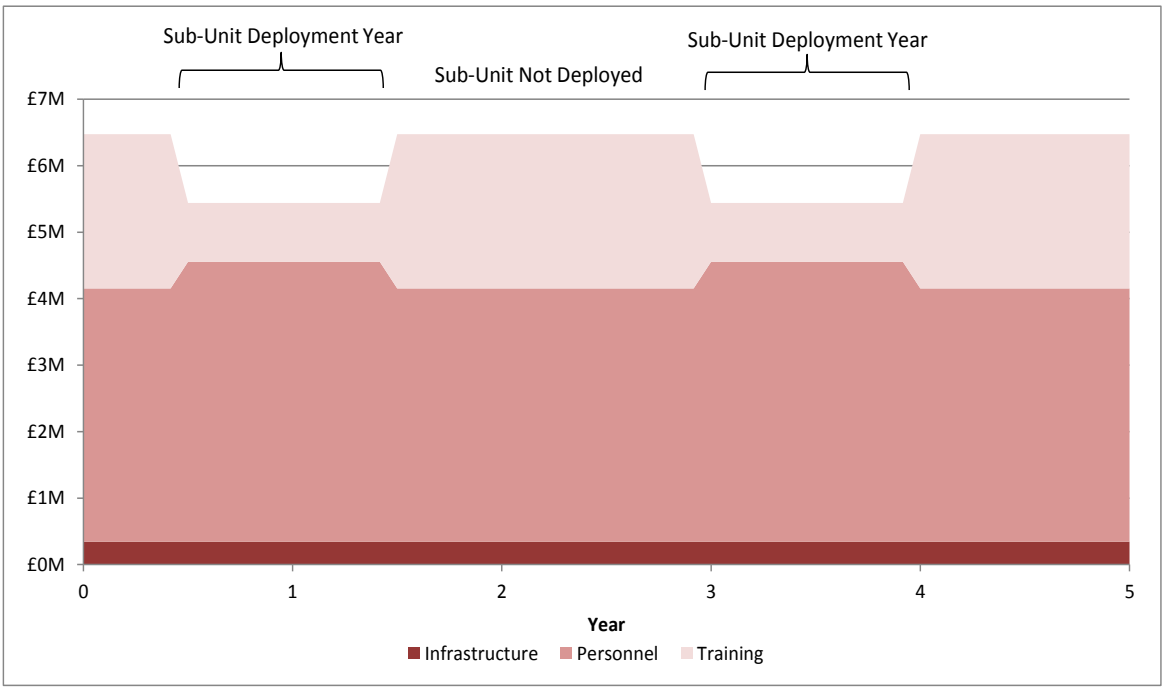

Figure 4 – In year costs of a single Regular Lt Inf Coy (most likely)

Results – Light Infantry Company

43. Table 7 below shows the relative cost breakdown of a Regular and Reserve Light Infantry Company in a non-deployment year and a deployment year. It shows that:

a) Two Lt Inf Reserve Sub-Units are expected to be 31% to 50% of the cost of a single Lt Inf Regular Sub-Unit during non-deployment years;

b) Two Lt Inf Reserve Sub-Units are expected to be 93% to 155% of the cost of a single Lt Inf Regular Sub-Unit during deployment years;

c) If a normal deployment is assumed (i.e. one year deployed in five for a Regular Sub-Unit and one year in ten deployed for a Reserve Sub-Unit), two Reserve Lt Inf Coys are between 53-88% of the cost when compared to a single Regular Lt Inf Coy.

DLoD	Non-Deployment year (Own)			Deployment year (Use)			Weighted Average year		
	Minimum	Most likely	Maximum	Minimum	Most likely	Maximum	Minimum	Most likely	Maximum
Personnel	42%	51%	63%	108%	132%	162%	70%	86%	105%
Infrastructure	0%	0%	0%	0%	17%	91%	0%	7%	36%
Training	23%	28%	34%	94%	115%	140%	38%	46%	56%
Total	**31%**	**40%**	**50%**	**93%**	**122%**	**155%**	**53%**	**70%**	**88%**

Table 7 – Lt Inf Coy relative costs of two Reserve Sub-Units compared with a single Regular Sub-Unit

44. Table 8 below provides an indicative annual cost breakdown of a non-deployment year with respect to a Regular and Reserve Light Infantry Company. It shows that in both cases the greatest cost driver is personnel, accounting for over 50% of the total cost. It should be noted again that the figures provided below are for a 2:1 Sub-Unit comparison.

DLoD	Regular – Non-deployed (Own)			Reserve – Non-deployed (Own)		
	Minimum £M	Most likely £M	Maximum £M	Minimum £M	Most likely £M	Maximum £M
Personnel	3.4	3.8	4.2	1.8	1.9	2.1
Infrastructure	0.2	0.3	0.8	0.0	0.0	0.0
Training	2.1	2.3	2.6	0.6	0.7	0.7
Total	**5.7**	**6.5**	**7.5**	**2.3**	**2.6**	**2.9**

Table 8 – Lt Inf Coy cost breakdown, non-deployment year comparing two Reserve Sub-Units with a single Regular Sub-Unit

45. Table 9 below shows the annual cost of a deployment year with respect to a Regular and Reserve Light Infantry Company. In the figures below it demonstrates that the Reserve personnel cost is marginally greater than the Regular, which is driven by the 2:1 Sub-Unit scaling factor and additional Reservist costs such as Reservist award.

DLoD	Regular – Deployed (Use)			Reserve – Deployed (Use)		
	Minimum £M	Most likely £M	Maximum £M	Minimum £M	Most likely £M	Maximum £M
Personnel	3.8	4.2	4.6	5.0	5.6	6.1
Infrastructure	0.2	0.3	0.8	0.0	0.1	0.2
Training	0.8	0.9	1.0	0.9	1.0	1.1
Total	**4.8**	**5.4**	**6.4**	**5.9**	**6.6**	**7.4**

Table 9 - Lt Inf Coy cost breakdown, deployment year comparing the costs of two Reserve Sub-Units with a single Regular Sub-Unit

46. Figure 5 illustrates the major cost drivers for a Regular and Reserve Light Infantry Sub-Unit in a deployment year, non-deployment year and a weighted average year.

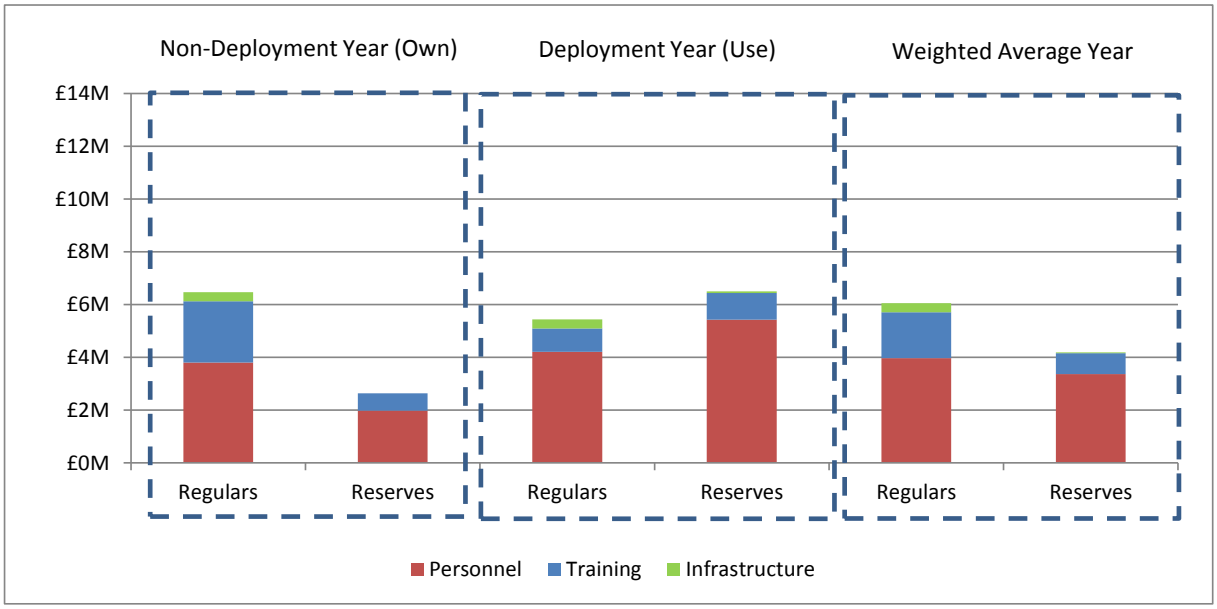

Figure 5 – Lt Inf Coy cost drivers comparing two Reserve Sub-Units with a single Regular Sub-Unit

Results – Armoured Squadron

47. Table 10 below shows the relative cost breakdown of a Regular and Reserve Armd Sqn in a non-deployment year and a deployment year. It shows that:

a) Two Armd Sqn Reserve Sub-Units are expected to be 26% to 40% of the cost of a single Armd Sqn Regular Sub-Unit during non-deployment years.

b) Two Armd Sqn Reserve Sub-Units are expected to be 90% to 146% of the cost of a single Armd Sqn Regular Sub-Unit during deployment years.

c) If a normal deployment is assumed (i.e. one year deployed in five for a Regular Sub-Unit and one year in ten deployed for a Reserve Sub-Unit) two Reserve Armd Sqns are between 45-71% of the cost when compared to a single Regular Armd Sqn.

DLoD	Non-Deployment year (Own)			Deployment year (Use)			Weighted Average year		
	Minimum	Most likely	Maximum	Minimum	Most likely	Maximum	Minimum	Most likely	Maximum
Personnel	38%	46%	56%	104%	127%	155%	66%	80%	98%
Infrastructure	0%	0%	0%	0%	17%	91%	0%	7%	36%
Training	22%	27%	33%	92%	112%	137%	36%	44%	54%
Total	**26%**	**32%**	**40%**	**90%**	**116%**	**146%**	**45%**	**57%**	**71%**

Table 10 – Armd Sqn relative costs of two Reserve Sub-Units compared with one Regular Sub-Unit

48. Table 11 below provides an indicative annual cost of a non-deployment year with respect to a Regular and Reserve Armd Sqn. It shows that the greatest cost driver is training for both Regulars and Reserves driven by high equipment running costs and ammunition costs.

DLoD	Regular – Non-deployed (Own)			Reserve – Non-deployed (Own)		
	Minimum £M	Most likely £M	Maximum £M	Minimum £M	Most likely £M	Maximum £M
Personnel	3.4	3.7	4.1	1.6	1.7	1.9
Infrastructure	0.2	0.3	0.7	0.0	0.0	0.0
Training	7.2	8.0	8.8	2.0	2.2	2.4
Total	**10.8**	**12.1**	**13.7**	**3.5**	**3.9**	**4.3**

Table 11 – Armd Sqn cost breakdown, non-deployment year comparing two Reserve Sub-Units with a single Regular Sub-Unit

49. Table 12 below shows the annual cost of a deployment year with respect to a Regular and Reserve Armd Sqn. Due to a reduced proportion of time spent training during deployment years and increase in operation allowances, personnel becomes the cost driver.

DLoD	Regular – Deployed (Use)			Reserve – Deployed (Use)		
	Minimum £M	Most likely £M	Maximum £M	Minimum £M	Most likely £M	Maximum £M
Personnel	3.7	4.1	4.6	4.7	5.3	5.8
Infrastructure	0.2	0.3	0.7	0.0	0.1	0.2
Training	2.8	3.1	3.4	3.1	3.4	3.8
Total	**6.7**	**7.5**	**8.7**	**7.8**	**8.7**	**9.7**

Table 12 – Armd Sqn cost breakdown, deployment year comparing two Reserve Sub-Units with a single Regular Sub-Unit

50. Figure 6 illustrates the major cost drivers for a Regular and Reserve Armd Sqn in a deployment year, non-deployment year and a weighted average year.

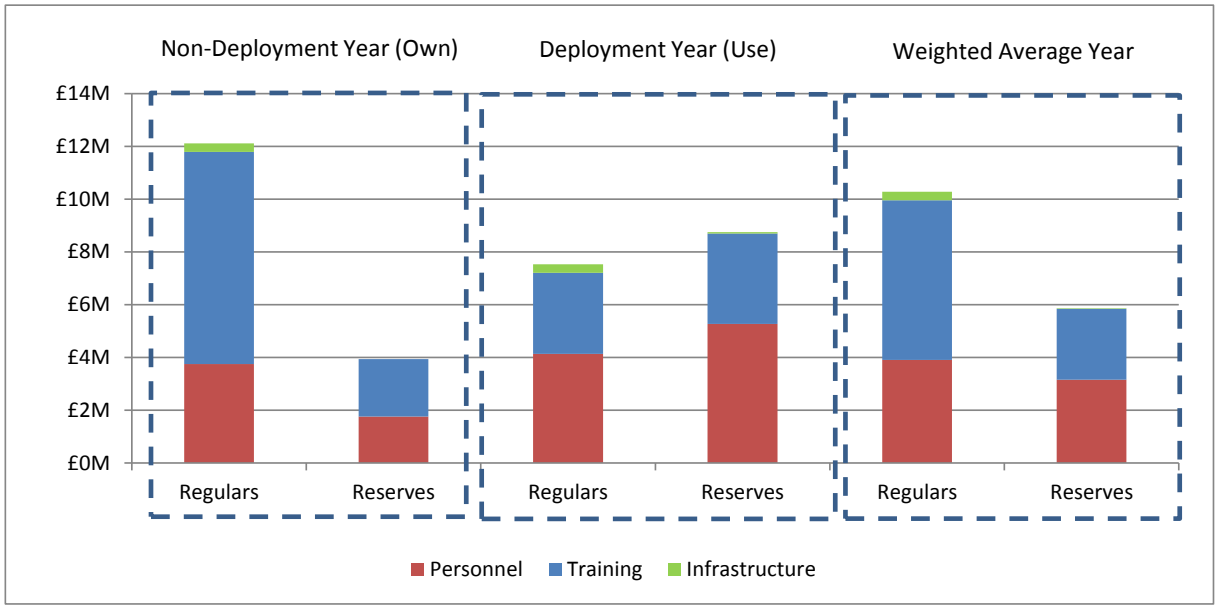

Figure 6 – Armd Sqn cost drivers comparing two Reserve Sub-Units with a single Regular Sub-Unit

Results – MLRS Battery

51. Table 13 below shows the relative cost breakdown of a Regular and Reserve MLRS Bty in a non-deployment year and a deployment year. It shows that:

a) Two MLRS Bty Reserve Sub-Units are expected to be 29% to 46% of the cost of a single MLRS Bty Regular Sub-Unit during non-deployment years.

b) Two MLRS Bty Reserve Sub-Units are expected to be 93% to 152% of the cost of a single MLRS Bty Regular Sub-Unit during deployment years.

c) If a normal deployment is assumed (i.e. one year deployed in five for a Regular Sub-Unit and one year in ten deployed for a Reserve Sub-Unit) two Reserve MLRS Btys are between 51-82% of the cost when compared to a single Regular MLRS Bty.

DLoD	Non-Deployment year (Own)			Deployment year (Use)			Weighted Average year		
	Minimum	Most likely	Maximum	Minimum	Most likely	Maximum	Minimum	Most likely	Maximum
Personnel	40%	49%	59%	106%	130%	159%	68%	83%	102%
Infrastructure	0%	0%	0%	0%	17%	91%	0%	7%	36%
Training	23%	28%	34%	93%	113%	138%	37%	45%	55%
Total	**29%**	**37%**	**46%**	**93%**	**120%**	**152%**	**51%**	**65%**	**82%**

Table 13 – MLRS Bty relative costs comparing two Reserve Sub-Units with a single Regular Sub-Unit

52. Table 14 below provides an indicative annual cost of a non-deployment year with respect to a Regular and Reserve MLRS Bty. It demonstrates how in the case of Regulars there is roughly an even split between personnel and training. As expected this falls between the Lt Inf and Armd Sqn case studies due to the nature of the equipment operated, i.e. more than Lt Inf and not as heavy as an Armd Sqn.

DLoD	Regular – Non-deployed (Own)			Reserve – Non-deployed (Own)		
	Minimum £M	Most likely £M	Maximum £M	Minimum £M	Most likely £M	Maximum £M
Personnel	3.9	4.3	4.7	1.9	2.1	2.3
Infrastructure	0.2	0.3	0.8	0.0	0.0	0.0
Training	3.5	3.9	4.3	1.0	1.1	1.2
Total	**7.6**	**8.6**	**9.8**	**2.9**	**3.2**	**3.5**

Table 14 – MLRS Bty cost breakdown, non-deployment year comparing two Reserve Sub-Units with a one Regular Sub-Unit

53. Table 15 below shows the annual cost of a deployment year with respect to a Regular and Reserve MLRS Bty. In the figures below it demonstrates that the Reserve personnel cost is marginally over the Regular, which is driven by the 2:1 Sub-Unit scaling factor and additional Reservist costs such as Reservist award.

DLoD	Regular – Deployed (Use)			Reserve – Deployed (Use)		
	Minimum £M	Most likely £M	Maximum £M	Minimum £M	Most likely £M	Maximum £M
Personnel	4.3	4.7	5.2	5.6	6.2	6.8
Infrastructure	0.2	0.3	0.8	0.0	0.1	0.2
Training	1.3	1.5	1.6	1.5	1.7	1.9
Total	**5.8**	**6.6**	**7.6**	**7.1**	**7.9**	**8.8**

Table 15 - MLRS Bty cost breakdown, deployment year comparing two Reserve Sub-Units with a single Regular Sub-Unit

54. Figure 7 illustrates the major cost drivers for a Regular and Reserve MLRS Bty Sub-Unit in a deployment year, non-deployment year and a weighted average year.

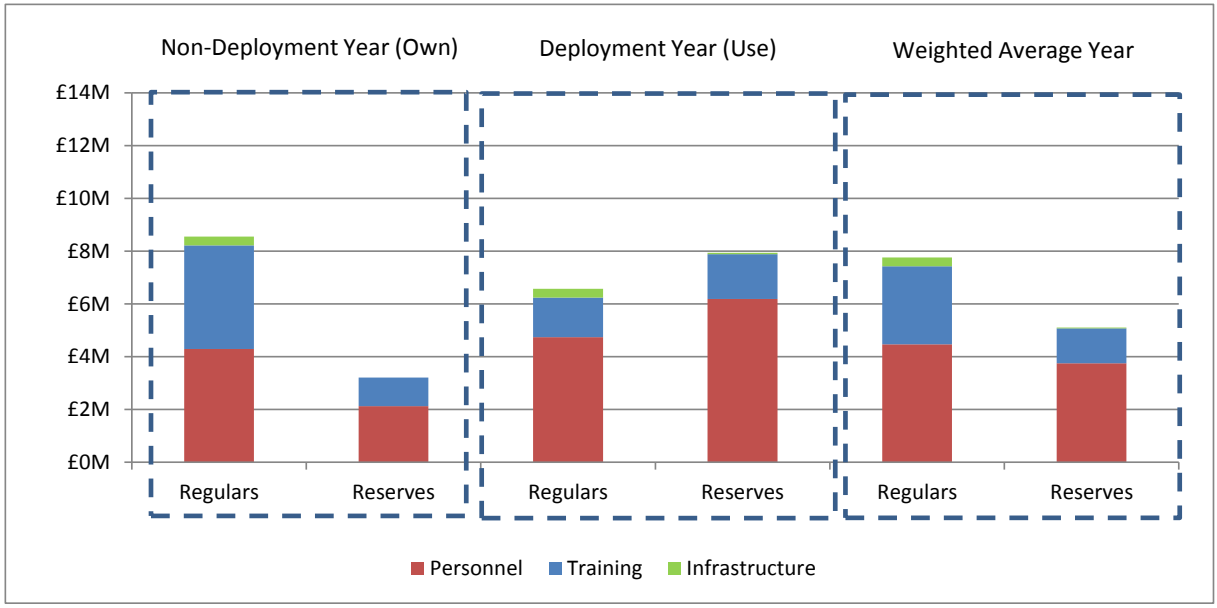

Figure 7 – MLRS Bty cost drivers comparing two Reserve Sub-Units with a single Regular Sub-Unit

Results – RLC Close Support Squadron

55. Table 16 below shows the relative cost breakdown of a Regular and Reserve RLC CS Sqn in a non-deployment year and a deployment year. It shows that:

a) Two RLC CS Sqn Reserve Sub-Units are expected to be 30% to 50% of the cost of a single RLC CS Sqn Regular Sub-Unit during non-deployment years.

b) Two RLC CS Sqn Reserve Sub-Units are expected to be 85% to 145% of the cost of a single RLC CS Sqn Regular Sub-Unit during deployment years.

c) If a normal deployment is assumed (i.e. one year deployed in five for a Regular Sub-Unit and one year in ten deployed for a Reserve Sub-Unit) two Reserve RLC CS Sqns are between 52-87% of the cost when compared to a single Regular RLC CS Sqn.

DLoD	Non-Deployment year (Own)			Deployment year (Use)			Weighted Average year		
	Minimum	Most likely	Maximum	Minimum	Most likely	Maximum	Minimum	Most likely	Maximum
Personnel	38%	47%	57%	99%	121%	148%	64%	78%	96%
Infrastructure	0%	0%	0%	0%	17%	91%	0%	7%	36%
Training	24%	29%	35%	96%	117%	142%	38%	47%	57%
Total	**30%**	**40%**	**50%**	**85%**	**113%**	**145%**	**52%**	**68%**	**87%**

Table 16 – RLC CS Sqn relative costs of two Reserve Sub-Units compared with one Regular Sub-Unit

56. Table 17 below provides an indicative annual cost of a non-deployment year with respect to a Regular and Reserve Close Support Squadron.

DLoD	Regular – Non-deployed (Own)			Reserve – Non-deployed (Own)		
	Minimum £M	Most likely £M	Maximum £M	Minimum £M	Most likely £M	Maximum £M
Personnel	4.9	5.4	6.0	2.3	2.5	2.8
Infrastructure	0.3	0.5	1.1	0.0	0.0	0.0
Training	1.4	1.5	1.7	0.4	0.4	0.5
Total	**6.5**	**7.5**	**8.8**	**2.7**	**3.0**	**3.3**

Table 17 – RLC CS Sqn cost breakdown, non-deployment year comparing two Reserve Sub-Units with a single Regular Sub-Unit

57. Table 18 below shows the annual cost of a deployment year with respect to a Regular and Reserve Close Support Squadron.

DLoD	Regular – Deployed (Use)			Reserve – Deployed (Use)		
	Minimum £M	Most likely £M	Maximum £M	Minimum £M	Most likely £M	Maximum £M
Personnel	5.4	6.0	6.6	6.5	7.2	8.0
Infrastructure	0.3	0.5	1.1	0.0	0.1	0.3
Training	0.5	0.6	0.6	0.6	0.7	0.8
Total	**6.2**	**7.1**	**8.4**	**7.1**	**8.0**	**9.0**

Table 18 – RLC CS Sqn cost breakdown, deployment year comparing two Reserve Sub-Units with a single Regular Sub-Unit

58. Figure 8 illustrates the major cost drivers for a Regular and Reserve RLC CS Sqn Sub-Unit in a deployment year, non-deployment year and a weighted average year.

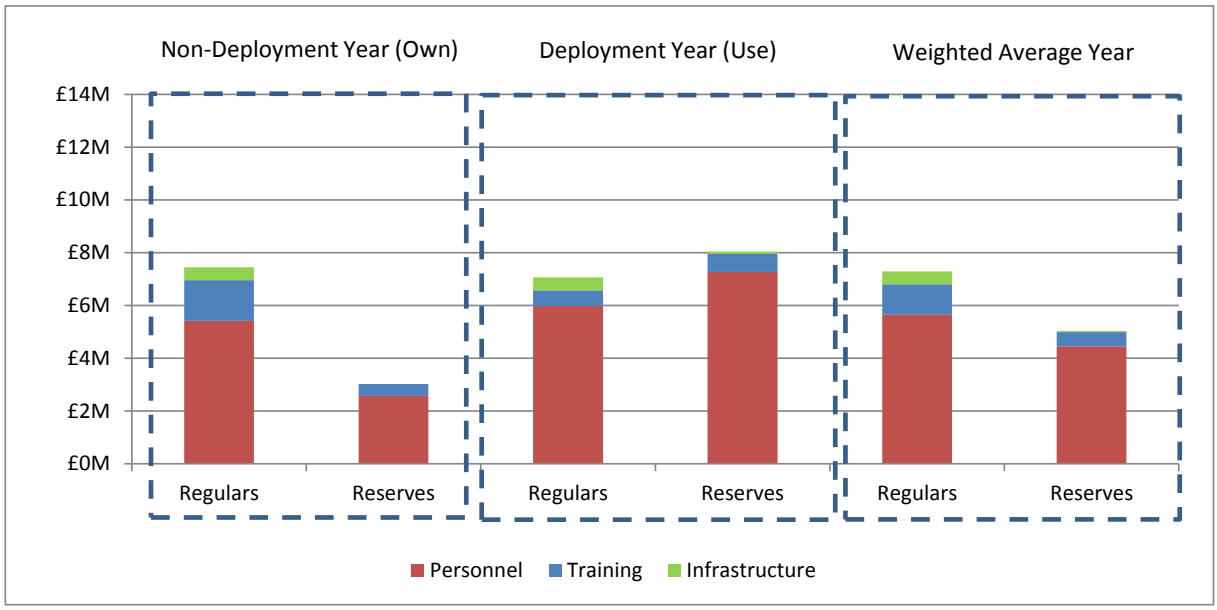

Figure 8 – RLC CS Sqn cost drivers comparing two Reserve Sub-Units with one Regular Sub-Unit

Results – Royal Signals ICS Squadron 2

59. Table 19 below shows the relative cost breakdown of a Regular and Reserve Signal Sqn in a non-deployment year and a deployment year. It shows that:

a) Two Signal Sqn Reserve Sub-Units are expected to be 31% to 51% of the cost of a single Signal Sqn Regular Sub-Unit during non-deployment years.

b) Two Signal Sqn Reserve Sub-Units are expected to be 89% to 147% of the cost of a single Signal Sqn Regular Sub-Unit during deployment years.

c) If a normal deployment is assumed (i.e. one year deployed in five for a Regular Sub-Unit and one year in ten deployed for a Reserve Sub-Unit) two Reserve Signal Sqns are between 53-87% of the cost when compared to a single Regular Signal Sqn.

DLoD	Non-Deployment year (Own)			Deployment year (Use)			Weighted Average year		
	Minimum	Most likely	Maximum	Minimum	Most likely	Maximum	Minimum	Most likely	Maximum
Personnel	40%	49%	59%	101%	123%	151%	66%	80%	98%
Infrastructure	0%	0%	0%	0%	17%	91%	0%	7%	36%
Training	23%	28%	35%	95%	115%	141%	38%	46%	56%
Total	**31%**	**41%**	**51%**	**89%**	**116%**	**147%**	**53%**	**69%**	**87%**

Table 19 – Signal Sqn relative costs of two Reserve Sub-Units compared with a single Regular Sub-Unit

60. Table 20 below provides an indicative annual cost of a non-deployment year with respect to a Regular and Reserve version of ICS Squadron 2.

DLoD	Regular – Non-deployed (Own)			Reserve – Non-deployed (Own)		
	Minimum £M	Most likely £M	Maximum £M	Minimum £M	Most likely £M	Maximum £M
Personnel	4.4	4.8	5.3	2.1	2.4	2.6
Infrastructure	0.2	0.4	0.9	0.0	0.0	0.0
Training	1.7	1.9	2.1	0.5	0.5	0.6
Total	**6.3**	**7.1**	**8.3**	**2.6**	**2.9**	**3.2**

Table 20 – Signal Sqn cost breakdown, non-deployment year comparing the costs of two Reserve Sub-Units with a single Regular Sub-Unit

61. Table 21 below shows the annual cost of a deployment year with respect to a Regular and Reserve ICS Squadron.

DLoD	Regular – Deployed (Use)			Reserve – Deployed (Use)		
	Minimum £M	Most likely £M	Maximum £M	Minimum £M	Most likely £M	Maximum £M
Personnel	4.8	5.4	5.9	5.9	6.6	7.3
Infrastructure	0.2	0.4	0.9	0.0	0.1	0.2
Training	0.7	0.7	0.8	0.8	0.8	0.9
Total	**5.7**	**6.5**	**7.6**	**6.7**	**7.5**	**8.4**

Table 21 – Signal Sqn cost breakdown, deployment year comparing the costs of two Reserve Sub-Units with one Regular Sub-Unit

62. Figure 9 illustrates the major cost drivers for a Regular and Reserve Sub-Unit in a deployment year, non-deployment year and a weighted average year.

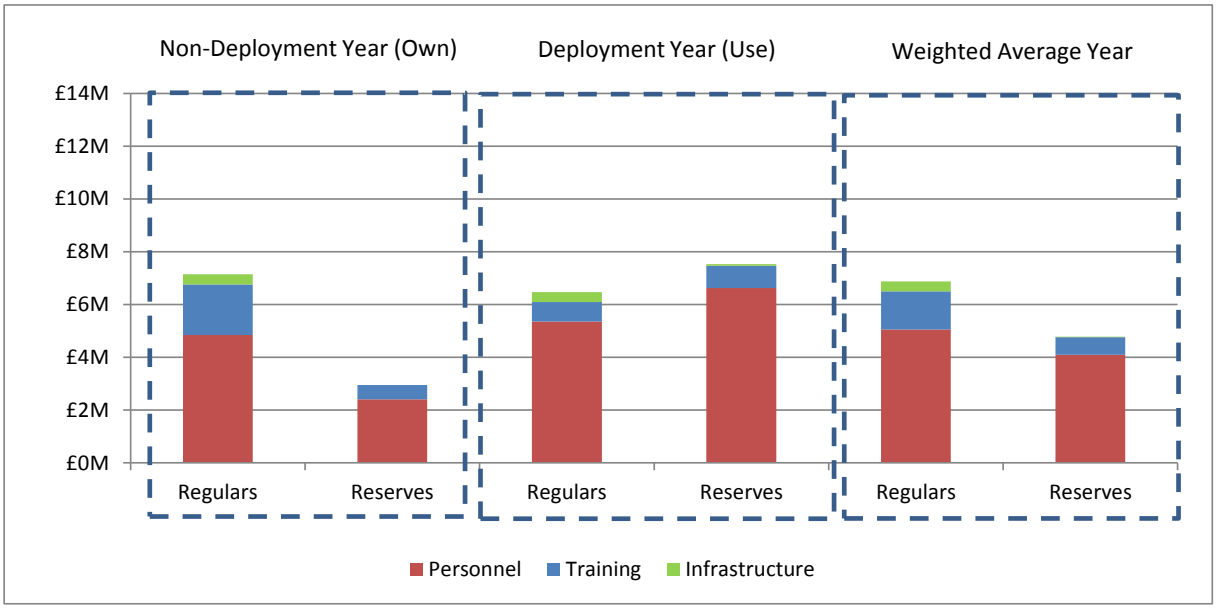

Figure 9 – Signal Sqn cost drivers comparing the costs of two Reserve Sub-Units with a single Regular Sub-Unit

Cost of one-off deployment

63. The cost of a one-off six month deployment during a five year period was also considered in the comparison[13]. In this instance, harmony guidelines would not be a constraining factor and therefore a one to one cost comparison between a Regulars and Reserves Sub-Units can be made.

64. Table 22 below shows a simple one year snap shot of a one to one comparison of each of the case studies for the non-deployment and deployment use cases.

Sub-Unit	Non-Deployment Year (Own)			Deployment Year (Use)		
	Minimum	Most Likely	Maximum	Minimum	Most Likely	Maximum
Lt Inf Coy	16%	20%	**25%**	74%	98%	**125%**
Armd Sqn	**13%**	16%	20%	70%	90%	113%
MLRS Bty	15%	19%	23%	74%	96%	122%
RLC CS Sqn	15%	20%	**25%**	**69%**	92%	119%
Sigs ICS Sqn 2	16%	20%	**25%**	71%	94%	119%

Table 22 – One to one comparison of a single Reserve Sub-Unit with a single Regular Sub-Unit

65. Previous analysis[14] investigating the cost of personnel has demonstrated that when deployed, a Reserve Sub-Unit is more expensive than a Regular Sub-Unit. The inclusion of training and infrastructure costs has now illustrated that a Reserve Sub-Unit is broadly comparable to, if not slightly less expensive (69-125%) than, a Regular Sub-Unit when deployed and between 13-25% when not deployed. This is principally driven through the Regular Sub-Unit conducting more training when not deployed and having significantly more take up of SLA and SFA compared to a Reserve Sub-Unit.

66. Table 23 below shows the previous results of comparing two Reserve Sub-Units to one Regular Sub-Unit in a one year snap shot.

Sub-Unit	Non Deployment Year (Own)			Deployment Year (Use)		
	Minimum	Most Likely	Maximum	Minimum	Most Likely	Maximum
Light Infantry Coy	31%	40%	50%	93%	122%	**155%**
Armoured Sqn	**26%**	32%	40%	90%	116%	146%
MLRS Bty	29%	37%	46%	93%	120%	152%
RLC Sqn	30%	40%	50%	**85%**	113%	145%
Signal Sqn	31%	41%	**51%**	89%	116%	147%

Table 23 – Two to one comparison of a two Reserve Sub-Unit with a single Regular Sub-Unit

67. When considering the comparison both the two to one and one to one comparison of Reserve and Regular Sub-Units it can be concluded that:

a) Non-deployed Reserve Sub-Unit(s) are 13-51% of the cost of a Regular Sub-Unit;

b) Deployed Reserve Sub-Unit(s) are 69-155% of the cost of a Regular Sub-Unit.

[13] If considering a change in policy direction in how the Reserves are to be used, (for example if Reserves are to be used only for one-off mobilisations on UK soil and no longer supporting enduring operations), not only should the assumptions of this analysis be revisited, but the wider impact of this policy change should be considered (e.g. understanding the attractiveness to join the Reserve, reviewing the training requirement and current unit structures).

[14] Dstl/PCS/706642 Regulars Vs Reserves Preliminary Cost Comparison, 18th November 2013 - RESTRICTED

Annex A – General Assumptions

Assumption	Comment	Source
All costs are at FY 2012/13 economic conditions. i.e. inflation has been excluded.	Driven by the raw data sourced from JPA and the Training Cost Model, uplifting economic conditions would not affect the relative costs	
Analysis has been set in a steady-state. No transitional costs have been included.	Ensures that capital investment costs resulting from transition to Army 2020[15] and FR20 are not included in the Sub-Unit comparison.	
No distinction has been made between the cost borne by MOD and the Net Additional Cost Of Operations (NACMO).		
Equipment costs are assumed as cost-neutral on the basis that major equipment is whole fleet managed.	As agreed with Head RF&C.	
Only costs that are specific to either a Reserve or Regular Sub-Unit have been included, no attempt has been made to apportion overheads such as Army HQ. These costs are assumed fixed and would not vary with changes to a specific Sub-Unit.	Any inclusion of such costs would potentially lead to a misleading result.	
Only cash costs have been included within the analysis, non-cash costs such as depreciation have been excluded.		
It is assumed that the full Reserve Sub-Unit will deploy, i.e. that there are no refusals to mobilise for operations.	It is recommended that the effects of different acceptance of call out rates be investigated in any future work	

Table A1 – General assumptions

[15] Such as the recovery of forces from Germany and subsequent rebasing in the UK.

Annex B - Personnel Assumptions

Assumption	Comment	Source
Deployable element of Regular and Reserve Sub-Units have been assumed as the same to enable a fair comparison.	The breakdown of each unit by rank has not been included in this report due to its sensitivity.	Transforming the British Army, Army 2020 Internal Report - RESTRICTED
Reserve Sub-Units allocated a non-deployable Permanent Staff Administrative Officer (PSAO) and one Regular Permanent Staff Instructor (PSI).	PSAO – Captain PSI – WO2	FR20
Quantity of civilian staff in Regular and Reserve Sub-Units assumed to be the same and therefore are cost-neutral.		
All Sub-Units assumed to be fully manned to enable fair comparison.		
Capitation Rates for Regular, Reserve and Called Out Reserves calculated from JPA data for FY 2012/13 have been used for personnel costs.	These rates have been calculated by service arm in order to ensure that as wide and representative a dataset as possible is drawn upon. JPA has been identified as the best data source for generating capitation rates, however it is acknowledged that there uncertainty into the in year accuracy of the claims, particularly in the Reserve case as a result of intermittent JPA Access.	JPA
Reserve Working Time Directive (WTD) has been assumed in personnel costs. This allows for 1.041 days leave for every 10 days of training completed.	Increase of 10.4% on Reservist pay for Cost of Ownership.	2013DIN01-225, November 2013 - UNCLASSIFIED
SCAPE is changing for Reservists to closer mirror Regulars. Therefore this has been applied using common proportion to the Regulars.	This is consistent with the previous work done and in line with the single service pension policy.	
The capitation rates have been adjusted in line with policy to account for operation allowances and to differentiate the cost of deployed/non-deployed Regular personnel.	£29 per day allowed for Operational allowance	
Recently announced recruitment and retention incentives have been excluded given the uncertainty into the levels of recruitment/retention required to maintain the force size in 2020.		
The additional cost of Reservists claiming Standard Learning Credits has been excluded in this analysis.	This is viewed as an immaterial cost.	

Table B1 – Personnel assumptions

Capitation Rate Breakdown

B1. The following table provides the key constituent elements of the personnel capitation rate extracted from the JPA data for FY 2012/13.

Basic Pay
ERNIC
SCAPE
Commitment Bonus
Other Allowances
Annual Bounty Payment
Education Allowance
Operational Allowance
Reservists Award
Living Overseas Allowance
Special Pay
Golden Hellos
Recruitment Bounty

Table B2 – Capitation rate breakdown

B2. It was observed from the data that approximately 400 allowances and pay elements were claimed across defence in FY 2012/13, a full list of these allowances is available via the paper authors.

Annex C - Infrastructure Assumptions

Assumption	Comment	Source
Capital costs of building additional service accommodation have been excluded from this analysis. This is to reflect the general assumption that the analysis is set in a steady-state (c2020) timeframe.		
Percentage of Regular service personnel within a Sub-Unit claiming SFA is calculated in line with LASR report. Reservist personnel are not entitled to SFA.	Figures have not been included in the report due to the classification.	D/DIO(Sec)5/3, Living Accommodation Strategy Review, D SAPT & D SP Pol, dated 18 February 2014 - RESTRICTED
Additional costs borne by the MOD for Service Families Accommodation (SFA) have been calculated in line with LASR report.		
Percentage of Regular service personnel within a Sub-Unit claiming SLA, calculated in line with LASR report.		
Percentage of Reserve personnel within a Sub-Unit claiming SLA, calculated in line with LASR report.		
Additional costs borne by the MOD for Single Living Accommodation (SLA) have been calculated in line with LASR report.		
The annual cost of RTMC Chilwell has been apportioned to Reserve Sub-Units to reflect the cost differential of pre-mobilisation activity that Regular Sub-Units conduct as cost neutral activity in Unit Lines.	Force Structure Cost Model for annual RTMC cost includes: Regular and Civilian personnel, joint medical and dental, Army Welfare Service, MOD Police and MPGS and training equipment cost.	
TA centre infrastructure running costs have been excluded. This is due to there being no comparable data for Regular Units.	A running cost of TA centres can be calculated from the DIO basing review if deemed necessary. However an equivalent for Regulars is not currently available and would lead to an unfair comparison. This is due to the nature of the regional prime contracts that DIO manages.	

Table C1 – Infrastructure assumptions

Annex D - Training Assumptions

Assumption	Comment	Source
Annual training costs calculated using the following method: The Training Cost Model (TCM) (developed for TESRR) uses the Dstl Force Structure Cost Model as the basis for assigning costs to Force Elements. The TCM then identifies which elements of a Force Element are training specific, i.e. identifying whether or not a Unit Identity Number (UIN) is related to training / how the size of a vehicle fleet is driven by the training requirement. The training cost has been apportioned to the Regular and Reserve Sub Units respectively by using a scaling factor based on the number of man training days assumed multiplied by the number of Sub-Units.	The TCM is a high level tool that does not differentiate between Regulars and Reserves. High level assumptions have been made to break the cost out. However it is recommended that bottom up estimate is sought when the data become available from Army HQ. Man training days has been identified as an important metric for allocating the cost as this is the primary differential between Regular and Reserve Units.	DSTL/DOC56831/1.5, Training Cost Model – High Level Assumptions and Results (TCM v49), June 2013 - RESTRICTED
The costs deemed to be directly scalable to training activity have been included and are as follows: • Running Costs • Fuel • Ammunition	See comment below	
The following elements of training costs have been excluded as they are overheads associated with training and not driven by training activity: • DIO • Training systems • Buildings • Contracts • Equipment production • Training platforms • Trainers (personnel) • Phase 1 and 2 trainees • External training	Although a significant number of cost elements have been excluded, the majority of the cost has been captured with the analysis. The elements not included are assumed not to differentiate between Regulars and Reserves.	

Assumption	Comment	Source
An average of 37 man training days per annum has been assumed for a Reservist in order to fairly apportion activity based training costs.	30 days per year (pre FR20 levels) when non-mobilised and 90 days when mobilised. As per harmony 4/5 years are non-mobilised and 1/5 are mobilised.	Dstl assumption, agreed with SO2 military advisor.
An average of 170 man training days per annum has been assumed for a Regular in order to fairly apportion activity based training costs.	225 day per year when non-deployed and 87 days pre deployment training in a deployment year. As per harmony 4/5 years are non-deployed and 1/5 are deployed.	Dstl assumption, agreed with SO2 military advisor.

Table D1 – Training assumptions

Annex E – Assumption Sensitivity

Aim

E1. This annex tests the assumptions underpinning the analysis. It identifies by how much the assumptions would have to change in order for Reserve Sub-Units to be more expensive than Regular Sub-Units.

Introduction

E2. In order to generate the estimates a number of assumptions were made. RF&C requested that Dstl investigate how sensitive the findings are to any variations in the assumptions.

E3. The assumptions investigated were:

c) The impact of including medically non-deployable (MND) personnel in the cost comparison;

d) The frequency of Reserve mobilisations.

Caveats

E4. Although these are two of the key assumptions in the paper which have been tested, it should be noted that other assumptions have been made and the analysis is subject to variations in these.

Key Findings

E5. The assumptions do not affect the key findings within the initial analysis **unless**:

a) At least 54% of Reservists are unable to mobilise in a five year period; or

b) Reservists mobilise for more than two in every five years.

Method

E6. In both cases, sensitivities on the assumptions have been made to understand when Reserve Sub-Units become more expensive than Regular Sub-Units over a five year period.

E7. Both assumptions investigated in this annex have been tested independently.

The Medically Non-Deployable (MND) Personnel Method

E8. If the percentage of personnel that are able to deploy within a five year period is less than 100%, the size of the generating force needs to be greater in order to deploy a formed Sub-Unit. Therefore the requirement is to understand what proportion of Reserve MND personnel there need to be for their cost to equal Regulars.

E9. To understand this, additional “non-deployed” Reserve Sub-Units have been applied to the estimate to understand when the cost of two Reserve Sub-Units is equal to that of a single Regular Sub-Unit.

E10. Personnel and infrastructure costs have been scaled up to reflect additional personnel being paid and accommodated.

E11. For this sensitivity analysis, only Light Infantry were considered. This is considered both appropriate and robust because:

- Training costs are not scaled in this analysis. A lower proportion of Light Infantry costs are due to training when compared to Royal Artillery / Royal Armoured Corps sub-units.
- As a result, the Light Infantry comparison is more sensitive to changes in MND rates than Royal Artillery / Royal Armoured Corps, and comparable to Royal Signals and Royal Logistics Corps.
- This means that the other sub-units would require either approximately the same or even higher levels of Reserve MND personnel to affect the high level results of the cost comparison.

The Frequency of Reserve Deployments Method

E12. Noting that this current assumption is the maximum permitted under policy, RF&C tasked Dstl to investigate how often a Reserve Sub-Unit would need to deploy in order to be the same cost as a Regular Sub-Unit.

E13. A simple sensitivity was conducted for this analysis, altering the baseline for Reserves (one year mobilised and four years not mobilised) to two years mobilised and three years not mobilised in five, and for Regulars to two years deployed in five.

Results

Medically Non-Deployable Personnel

E14. Some data has been provided on Regular and Reserve personnel:

- Regulars: 9.9% medically non-deployable (January 2015)[16].
- Reserves: 14.3% medically non-deployable (OP TELIC as of September 2007)[17].
- Reserves: 4.7% medically non-deployable (OP HERRICK as of September 2007)[18].

E15. However, these figures are indicative and not robust enough to make a direct comparison between Regulars and Reserves. Instead, sensitivity analysis has been conducted to show how high the Reserve MND rate would have to be to change the results of the comparison in the weighted average case. See Figure E1.

[16] Defence Statistics, February 2015.
[17] RTMC Chilwell, October 2007.
[18] RTMC Chilwell, October 2007.

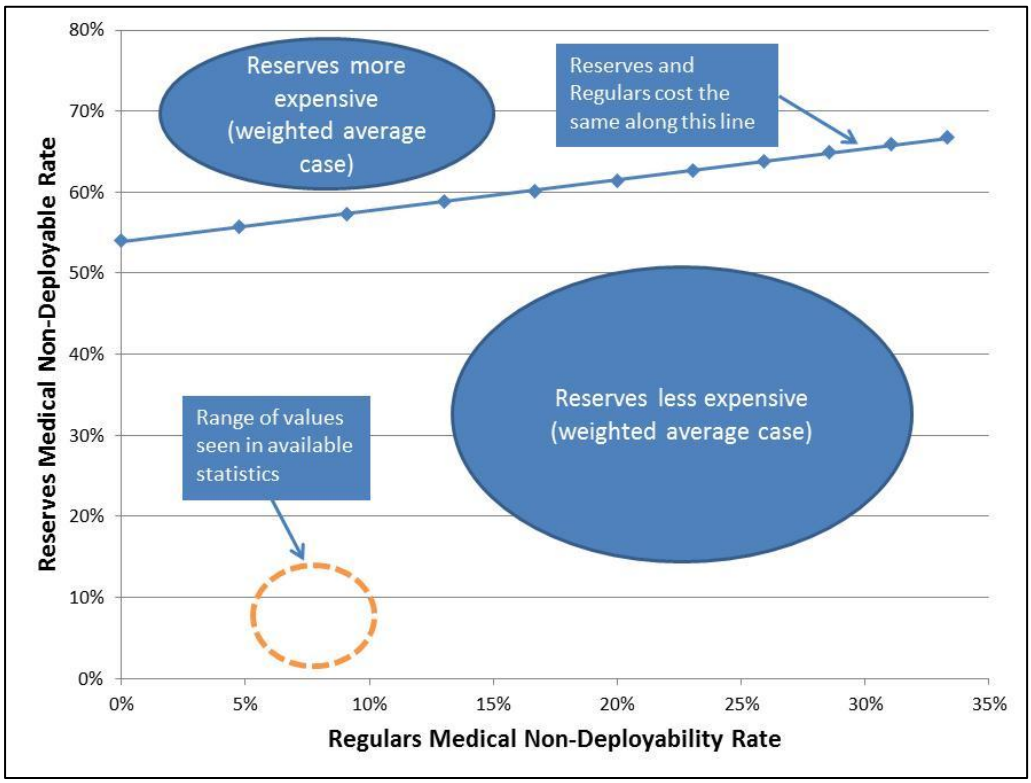

Figure E1: Effect of Medically Non-Deployable (MND) rates on the results of the cost comparison. Reserves remain less expensive than Regulars unless the Reserve MND rate is above at least 54%. The range of values from available statistics on MND is shown for perspective.

E16. The inclusion of medically non-deployable (MND) personnel would only affect the results of the analysis if more than 54% of Reservists were unfit to deploy.

E17. Note: The enduring case, which is the most frequent level of deployment allowed under harmony guidelines, is the case in where the Reserves are most expensive. In lower-intensity use cases the MND rate for Reserves would have to be even higher for Reserves to be as expensive as Regulars.

E18. Whilst Dstl were asked to consider the assumption of including Medically Non-Deployable personnel in the cost comparison, this analysis is applicable for any reasons for not being deployable, such as willingness to deploy.

The Frequency of Deployments

E19. Table E2 below illustrates the relative cost of the two Reserve Sub-Units compared with a single Regular Sub-Unit when mobilising each Reserve sub-unit two years in five, and each Regular sub-unit four years in five.

Unit	Relative Cost
Lt Inf Coy	103%
Armd Sqn	92%
MLRS Bty	100%
RLC CS Sqn	98%
Sigs ICS Sqn 2	100%

Table E2: Relative costs comparison of each unit when testing the assumption on deployment frequency.

E20. This shows that each Sub-Unit would have to deploy at twice what is currently viewed as the most stressing deployment pattern under current policy, for Reserves to cost approximately the same as Regulars. This demonstrates that the assumption made on maximum permitted deployment rate is robust unless policy was to significantly change.

Annex F – Defence Statistics Medically Non Deployable

F1. Defence Statistics (DS) Health provided information on the Medical Deployability Standard (MDS) status for UK Army personnel, used in Annex E of this report. This annex outlines the full analysis and background notes supporting the information provided.

F2. Table F1 below provides a breakdown of the proportion of Regular UK Army full-time personnel who are trained and serving against requirements, with an MDS status of Medically Non-Deployable (MND). Figures are provided for six years between 2010-2015 as at 1st of January.

	DS Derived MND [1]
Date	**Percent**
Jan-10	6.7
Jan-11	6.8
Jan-12	7.3
Jan-13	8.0
Jan-14	8.7
Jan-15	9.9

[1] UK Army personnel full time trained including apportioned blanks

Table F1: UK Army personnel, full time trained and serving against requirements, with a Medical Deployability Standard (MDS) status recorded as MND, 2010-2015, percentage

F3. A derived MDS variable has been created which utilises a combination of MDS and PULHHEEMS codes on Joint Personnel Administration (JPA) and the Defence Medical Information Capability Programme (DMICP). The derived MDS variable takes the data source with the most up to date information.

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Background Notes

F4. Until 1 April 2013, the derived MDS was referred to as DASA derived MDS.

F5. When calculating the derived MDS there are a small proportion of service personnel (under 0.1%) with no MDS. These non MDS records were apportioned out (i.e. allocated in the same proportion as personnel who have a populated MDS in that service).

F6. Service personnel with medical conditions or fitness issues which affect their ability to perform their duties will generally be referred to a medical board for a medical examination and review of their medical grading. The patient may be downgraded, to allow for treatment, recovery and rehabilitation. Medically downgraded personnel are those personnel who have been assessed by a medical board and subsequently awarded a Medical Deployability Standard (MDS) of either Medically Limited Deployable (MLD) or Medically Non Deployable (MND).

F7. Medically Limited Deployable (MLD) personnel are medically fit for duty with minor employment limitations. MLD personnel may have a medical condition or functional limitation that prevents the meeting of all Medically Fully Deployable (MFD) requirements. MLD personnel can undertake full employment with possible limitations on their deployability.

Their condition must not be vulnerable to exacerbation due to deployment or impose a constant demand on medical service on exercise or deployment.

F8. Medically Non Deployable (MND) personnel are medically fit for duty with major employment limitations or are medically unfit for service. MND personnel have a medical condition or functional limitation that prevents the meeting of all MLD requirements. MND personnel are not fit to deploy on operations but may be deployable on UK based exercises and should be able to work effectively for at least 32.5 hours per week. They may require continued medical care, long term medication and access to secondary care facilities.

F9. MND personnel become medically unfit for service if they cannot perform their primary employment with reasonable adaptation, are unable to attend work for 32.5 hours per week, if they are unable to deploy on local exercises or if employment would exacerbate their condition and affect their health.