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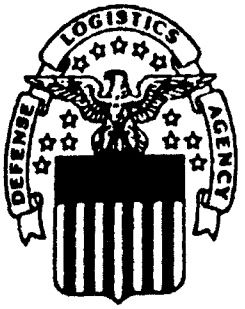
DLA-93-P10174/P20210

DISTRIBUTION COST ANALYSIS IN SUPPORT OF THE CLOTHING SIZE REDUCTION AND STANDARDIZATION INITIATIVES OF DEFENSE MANAGEMENT REVIEW DECISION 903

February 1993

OPERATIONS RESEARCH AND ECONOMIC ANALYSIS OFFICE



DEPARTMENT OF DEFENSE
DEFENSE LOGISTICS AGENCY

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DLA-L

FOREWORD

The Defense Logistics Agency (DLA) Directorate of Supply Operations and the DLA Office of Policy and Plans directed that the DLA Operations Research and Economic Analysis Management Support Office (DORO) determine the distribution costs for the Defense Management Review Decision (DMRD) 903 clothing size reduction and standardization initiatives. Models were developed to determine the historical and consolidated distribution cost for the management of the items affected by this DMRD. Costs were estimated for the last 3 years (1990-1992) and projected forward 2 additional years.

Our thanks are extended to all the personnel at the Defense Personnel Support Center (DPSC-FS) who provided data on the items selected for size reduction, personnel at Defense Distribution Depot Memphis, TN (DDMT) who provided input on the tasks required to receive, store, and issue a clothing article, and to the staff of the DLA Performance Standards Support Office (DPSSO) who provided the manhour standards for DLA depot personnel to complete the identified tasks. All these inputs were vital in the development of the depot warehouse workload and transportation model.

Christine L. Gallo.

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Executive Director
(Plans & Policy Integration)

EXECUTIVE SUMMARY

In order to decrease the budget requirements and to provide for greater efficiencies within the Department of Defense (DoD), a series of Defense Management Review Decisions (DMRD) were developed. Among these was the DMRD 903 which calls for several initiatives to be implemented by the Defense Logistics Agency (DLA). Two of those efforts, dealing with clothing and uniform articles, are the subject of this report.

As background, the Defense Personnel Support Center (DPSC) manages most clothing articles. Each type of clothing item is grouped into what are known as Procurement Group Codes (PGCs). In turn, each unique size is managed as an individual National Stock Number (NSN) within the PGC which defines a type clothing item.

The first initiative requires that there be a decrease in the number of sizes carried within selected PGCs. This effort was motivated by the fact that, as compared to private industry which typically offers far fewer sizing options, the DoD carries many more sizes of a given clothing article. It was believed that successful implementation of this effort would result in bringing DoD more in line with the practices of the commercial sector and save money. Most of the savings identified under this project are the result of this initiative.

The second effort assessed by this study focused on standardization across the uniformed Services. Currently, there exists many Service unique clothing and uniform articles. These would include items such as utility coveralls. By having the Services agree on what items should become common, it was thought that substantial savings could be achieved. However, this initiative, which was limited to thirty-three items, had almost no impact on savings.

The Defense Logistics Agency Operations Research and Economic Analysis Office (DORO) was tasked to determine the expected distribution savings resulting from implementation of the size reduction and standardization initiatives. Results of this study indicate that, with implementation of these initiatives, savings will likely result in the range of $1.7 to $2.5 million. These projected savings were based on the April 1992 clothing and uniform item lists provided by DPSC.

These projected savings have been predicated on the clothing articles selected for deletion being immediately removed from the supply system. The study team has learned that this is not likely to happen since the clothing articles selected for deletion are planned to be attrited from the system. Consequently, our analysis of the stock-on-hand and the historical monthly activity for the deleted articles has indicated that almost 75 percent of the items will still be in the system by the end of the projected 5 year time horizon for the DMRD 903 size reduction initiative. Lastly, given the anticipated force structure reductions, our savings projections are more optimistic than what is likely to be experienced since our estimates are based on the historical demands associated with larger force levels.

To more effectively capitalize these initiatives, the following actions are recommended:

* Conduct a depot storage location analysis on clothing articles to determine the economics of more efficient storage.

* Conduct an analysis for clothing NSNs programed to be deleted to assess the economics of disposal as opposed to retention.

* Conduct an analysis on the cataloging procedures which appear to adversely impact Item Manager workloads.

* Survey customer ordering patterns to determine whether more efficient ordering can be accomplished.

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SECTION 1
INTRODUCTION

The Directorate of Supply Operations (DLA-O) and the Office of Policy and Plans (DLA-L) directed that an analysis of the size reduction and standardization initiatives of Defense Management Review Decision (DMRD) 903 be conducted at the depot level to determine its affect on distribution costs for the Defense Logistics Agency (DLA). In conjunction with this analysis, the cost to DLA to distribute a clothing National Stock Number (NSN) article was to be developed. The study was initiated in Fiscal Year (FY) 1992 and was conducted in accordance with the study plan approved in January 1992 using data provided by the Defense Personnel Support Center (DPSC) as of April 1992.

1.1 BACKGROUND

DMRD 903 was initially released in FY 89 with a projected total savings of 940 million dollars over a 5 year time period. These savings were estimated across the four initiatives comprising the DMRD; namely, the size reduction effort (subject of this report), the standardization initiative (subject of this report), the tailoring assessment, and lastly, the commercial specification effort. A Flag Officer Steering Group (FOSG) subsequently developed projections of 50 to 70 million dollars of savings for the 5 year period. Due to the wide variation in projected savings, the FOSG requested that additional analysis be accomplished.

1.2 SCOPE

Under the size reduction and standardization initiatives, DPSC has been charged with the task of reducing both items and the number of unique clothing sizes for a wide range of clothing articles. In the management of clothing, DPSC groups the various sizes (which are the NSNs) for a given article of clothing (e.g., shirt, long sleeve) into a Procurement Group Code (PGC). The intent of DMRD 903 size reduction effort has been to bring the military sizes more in line with those offered in the commercial sector. This contrasts with the intent of the standardization effort (see Appendix B for NSN listing) which was to reduce the number of common type uniform items and was limited to only thirty-three items at the time all input data was finalized in April 1992.

Displayed in Figure 1-1 are graphics depicting the impacted C & T clothing articles under the size reduction initiative of DMRD 903. The graphic on the left shows the percentage of all C & T NSNs impacted under DMRD 903. From an NSN perspective there is apparently little impact, but from a PGC perspective there is a much larger impact.

This study was intended to determine the distribution cost over a maximum procurement cycle (3 years) for those items that had been selected for deletion as of April 1992. The cost included the inbound (1st destination) transportation cost, the warehouse handling cost, and the outbound (2nd destination) transportation costs. Visits were conducted to DPSC and Defense Distribution Depot Memphis, TN (DDMT) to determine the operations at each location in regard to clothing articles identified under the size reduction initiative.

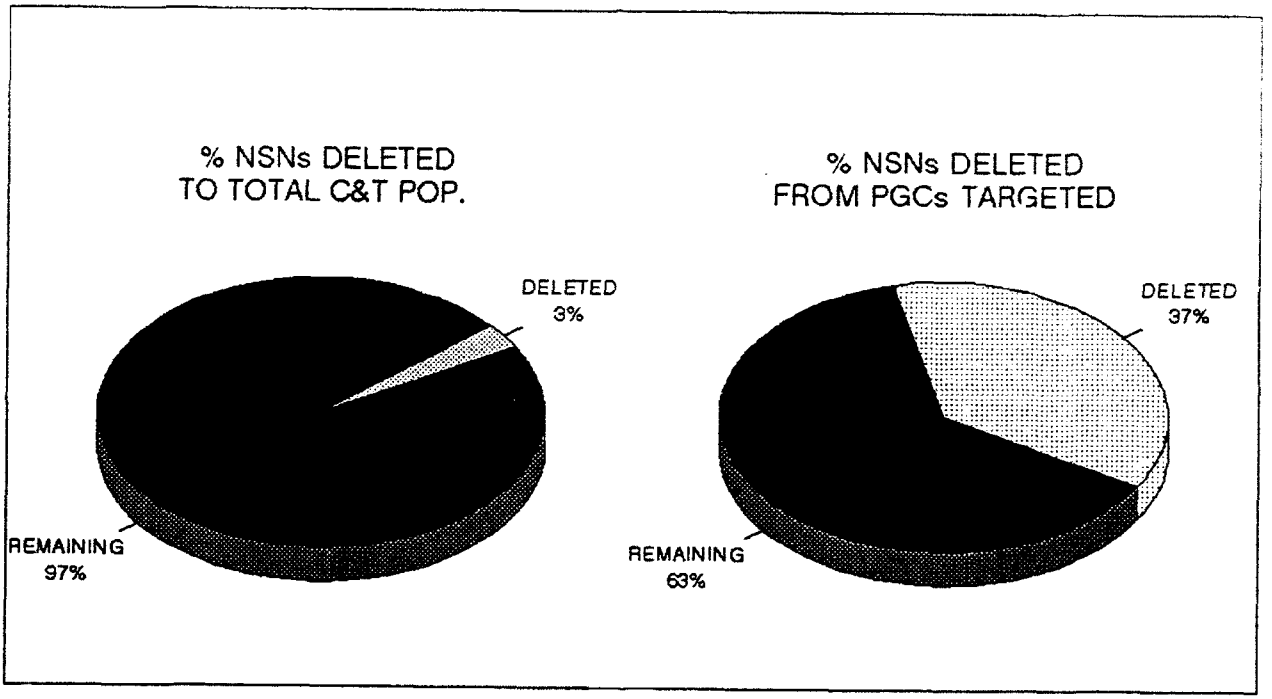


Figure 1-1. C & T Population Impacted

1.3 OBJECTIVE

The principal goal of this study has been to determine the effect on distribution costs from the size reduction and standardization efforts of DMRD 903 over the 3 year maximum procurement cycle and to project this effect forward an additional 2 years. An additional objective of the analysis was to provide a single cost for management of a clothing item at the distribution level.

SECTION 2
METHODOLOGY

This section will provide a synopsis of the study approach used for completing this project. Included in this description will be the development of the warehousing costs associated with the handling of clothing articles in the depots, associated transportation costs, consolidation methodology, and a sensitivity analysis of a two site storage system.

2.1 DEPOT COST DEVELOPMENT

The depot handling costs were developed using a composite of the time standards provided by the DLA Performance Standards Support Office (DPSSO) and historical workload for each of the DLA depots. Workload was based on the material release orders (MROs), receipts, and return action. The DPSSO work standards provided the time standards at each of the depots to perform the functions required to complete either an MRO, receipt, or a return.

Using historical information obtained from the DLA Integrated Data Bank (DIDB), a count was conducted of the number of MROs, receipts, and returns each depot processed during a single year for clothing items. These totals were then used to weight the time each depot required to complete one of the three actions. The weighted times were then combined to form the DLA composite of the time required to complete a typical action. These composite time standards were then combined with the average pay scale per hour to obtain a cost per action. (See Appendix A for details.)

2.2 TRANSPORTATION COST METHODOLOGY

The transportation costing methodology used for this study was based on a previous DLA-DORO study, Stockage Location Policy Analysis, project number DLA-92-P10148, dated August 1992. The objective of the transportation analysis in this study was to determine both inbound and outbound transportation costs.

2.2.1 TRANSPORTATION LOGIC

Data were collected using the DIDB to determine the total number of MROs and receipts that occurred during the 3 year period for the PGCs selected. The item, the customer code and address, vendor zip code, depot code and address, priority, item unit weight, and quantity of the shipment were included in the data collected. Using these data, shipments were classified as either bin or bulk with bin shipments weighing 70 pounds or less. The customers were

grouped on a geographical basis into 78 regional clusters (for additional data on the development of these transportation clusters, refer to the Stockage Location Policy Analysis described in the previous paragraph) based on their zip codes in order to estimate the mileage over which the items were transported. To determine shipping rates, shipments were broken into five transportation classes; namely, air small parcel, air freight, surface parcel, less-than-truckload (LTL), and truckload (TL).

2.2.2 TRANSPORTATION CLASSIFICATION

Transportation mode classification was based on distance travelled, shipment weight, and priority. Requisitions with priority codes of 1 through 3 were treated as Issue Priority Group (IPG) I, i.e., high priority. These were treated as air shipments that were assigned to air parcel if less than 99 pounds, air freight if greater than 99 pounds with a shipping distance greater than 400 miles, or surface freight if the weight was greater than 99 pounds and the distance was less than 400 miles. All other shipments were treated as surface parcel rates if weight was less than 70 pounds, LTL if weight was greater than 70 pounds but less than 10,000, and TL if greater than 10,000 pounds.

2.2.3 TRANSPORTATION COST ESTIMATION

The transportation cost was based on a ton-mile estimation. Mileage was computed from the vendors' corporate headquarters to the depot and from the depot to the requisitioner's location. The Federal Supply Code for Manufacturer (FSCM), also known as the Commercial and Government Entity Code (CAGE), was used to identify the corporate address for each contract. These codes were used to identify the zip code for the corporate address which was used to group the vendor into the 78 regional clusters as previously stated. The historical DIDB provided the actual zip codes for the customers. The mileage estimation was then combined with the weight classification and a computed shipment weight to determine the final shipment cost. These transportation flows are depicted in Figure 2-1.

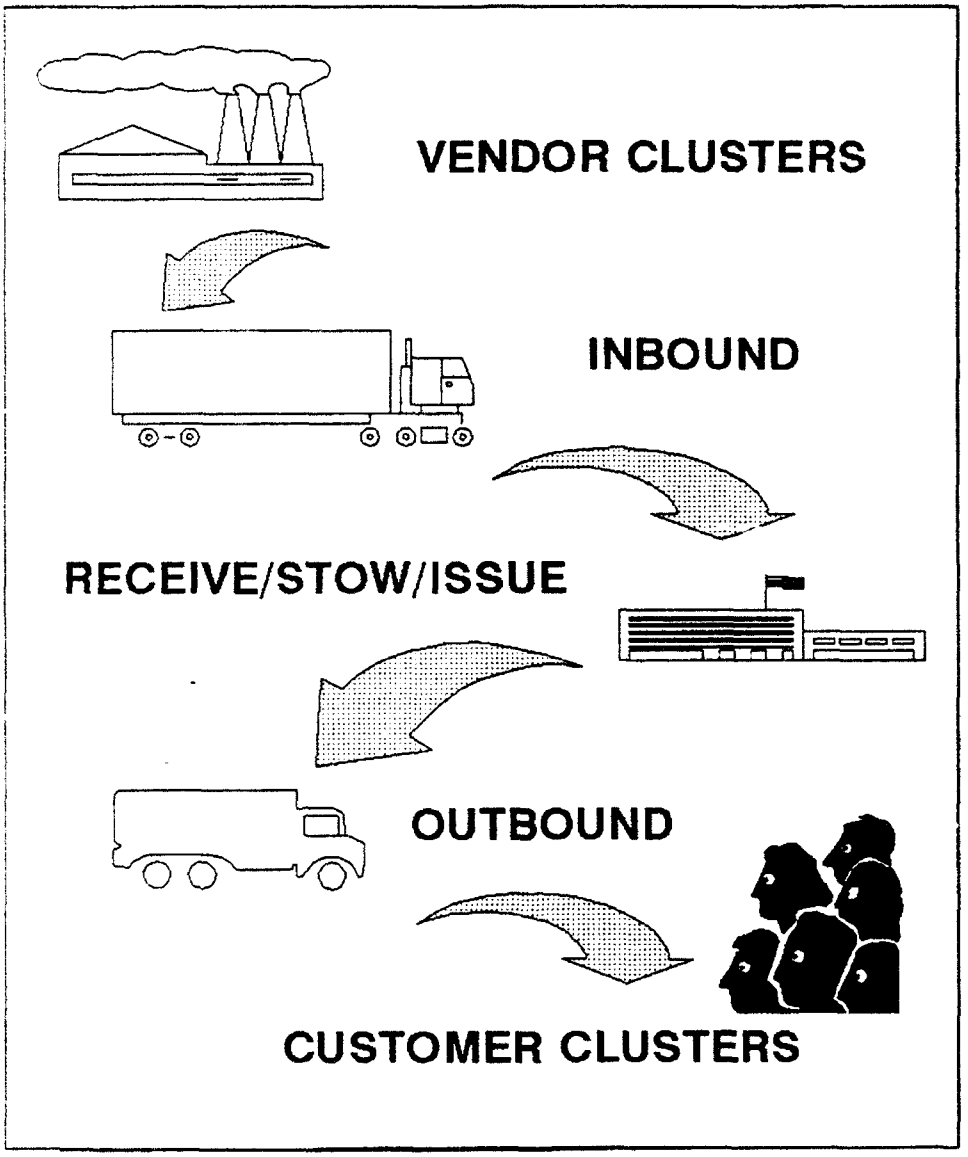


Figure 2-1. Cost Flows as Modeled

2.3 SPECIAL MODELING CRITERIA

To determine the effect of the size reduction and standardization efforts for clothing articles on the transportation and warehouse workload, it was necessary to model customer ordering patterns on replacement NSNs. This was accomplished by using historical customer ordering patterns to develop a consolidation methodology.

This approach combined historical receipts and MROs for the deleted clothing article with receipts and MROs for their replacement article. The study team assumed that if requisitions were received for both the old NSN and its replacement NSN, within a 7 day window, then future requisitions would reflect the total amount ordered for both of those requisitions. Consolidation was accomplished by comparing historical actions (MROs or receipts) that occurred for a deleted NSN, to a corresponding action that occurred for its replacement NSN. To be considered a match, the deleted NSN, and its replacement NSN, must have had an equivalent action occurring from the same customer or vendor within 7 days of each other, and the same depot must have filled the MRO or received the receipt.

When this match occurred the study team modeled them as a single action, with a quantity equal to the sum of the original two actions. If there was no corresponding match, the actions were modeled exactly as they historically occurred for the deleted NSN.

Using an example based on the size reduction effort, Figure 2-2 depicts MROs before and after the consolidation process. The lines connecting the before and after MROs show the consolidation impacts. Note that NSN 8405004516080 is a replacement for the deleted NSN 8405004441325 (replaced/deleted relationships are not shown in Figure 2-2 to reduce clutter). These two NSNs consolidate into a single MRO because they originate from the same depot and their dates are within 7 days of each other. Their individual quantities are added together and the date of the deleted NSN is taken in forming a single consolidated MRO. Likewise, NSN 84100i2299439 and NSN 84050012299437 consolidate into a single MRO with quantity 35 and date 0026.

Note that the last MRO with quantity 75 could have been consolidated with the third and fourth MROs only if its date was within 7 days of date 0026 (the date format consists of the left-most digit representing the year and the next three digits to the right being the day of the year - 0026 is the 26th day of 1990). Since its date was outside of the 7 day window, it remained a distinct MRO with no consolidation.

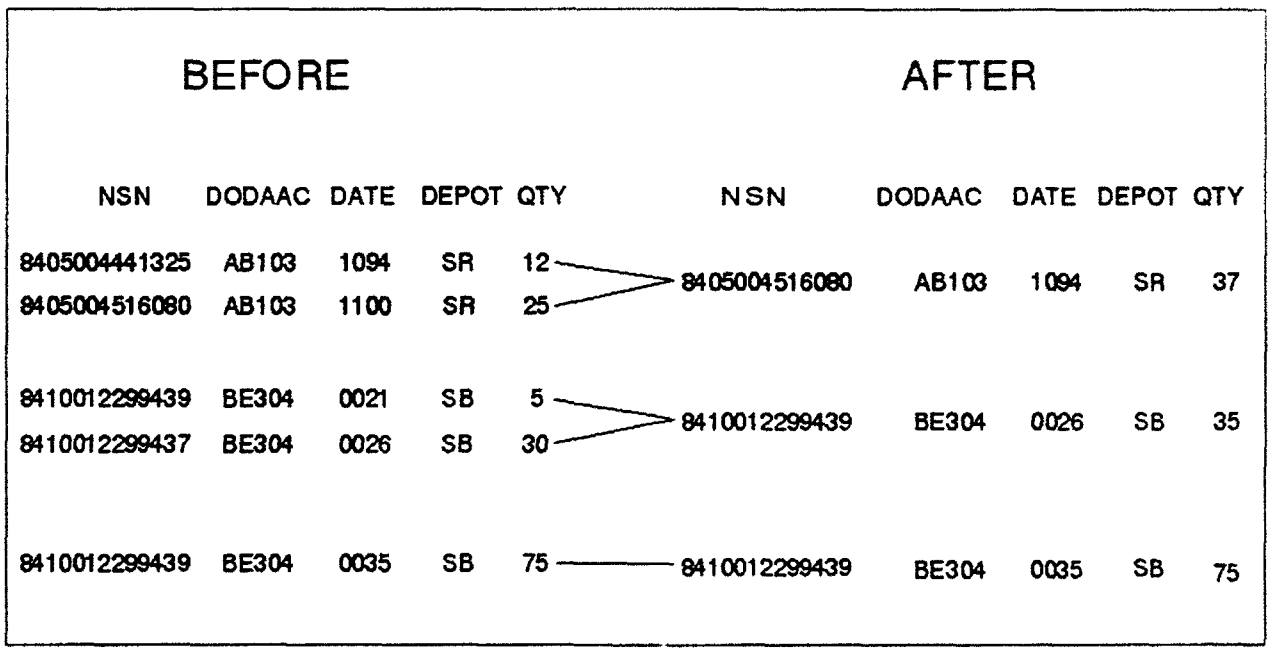


Figure 2-2. Consolidation Example

2.4 SENSITIVITY ANALYSIS

A sensitivity analysis was conducted by developing distribution costs based on the use of two depot distribution systems. One system was based on the seven leading historical depots (see Figure 2-3) using a "closest to customer" stockage policy. The other system represented a reduced storage system based on stocking clothing at only Memphis and San Joaquin under the "closest to vendor" policy (see Figure 2-4). In effect, the second system actually represented a single site storage system based in Memphis since all C&T vendors for the study population were found to be located in the eastern sections of the country.

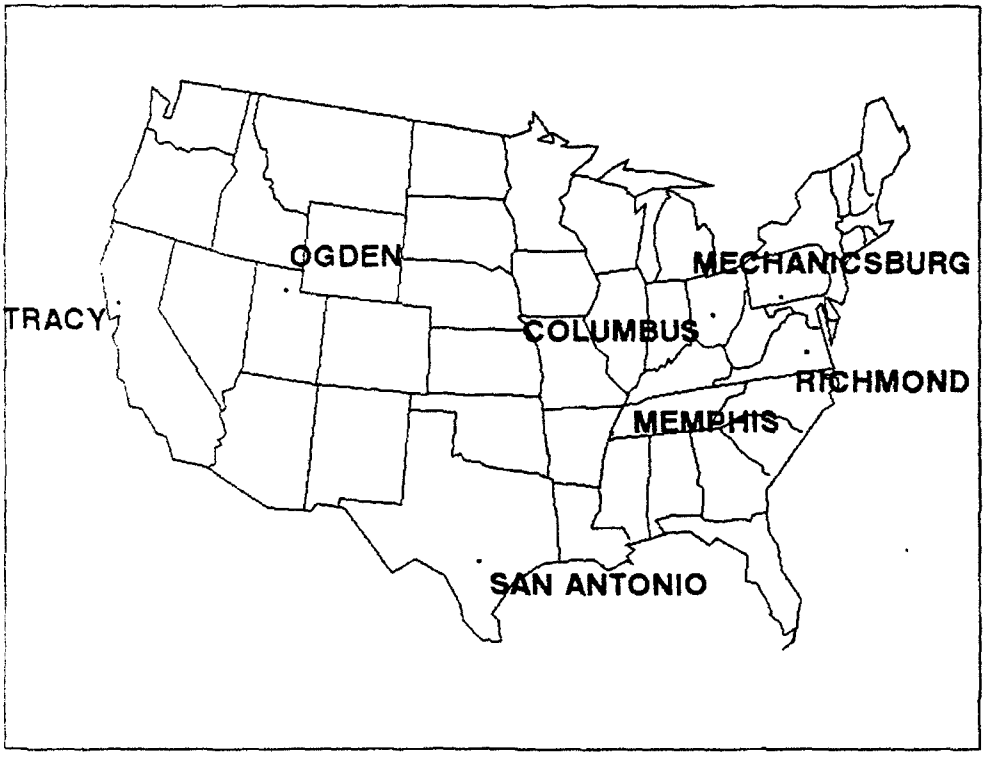


Figure 2-3. Historical Storage Sites

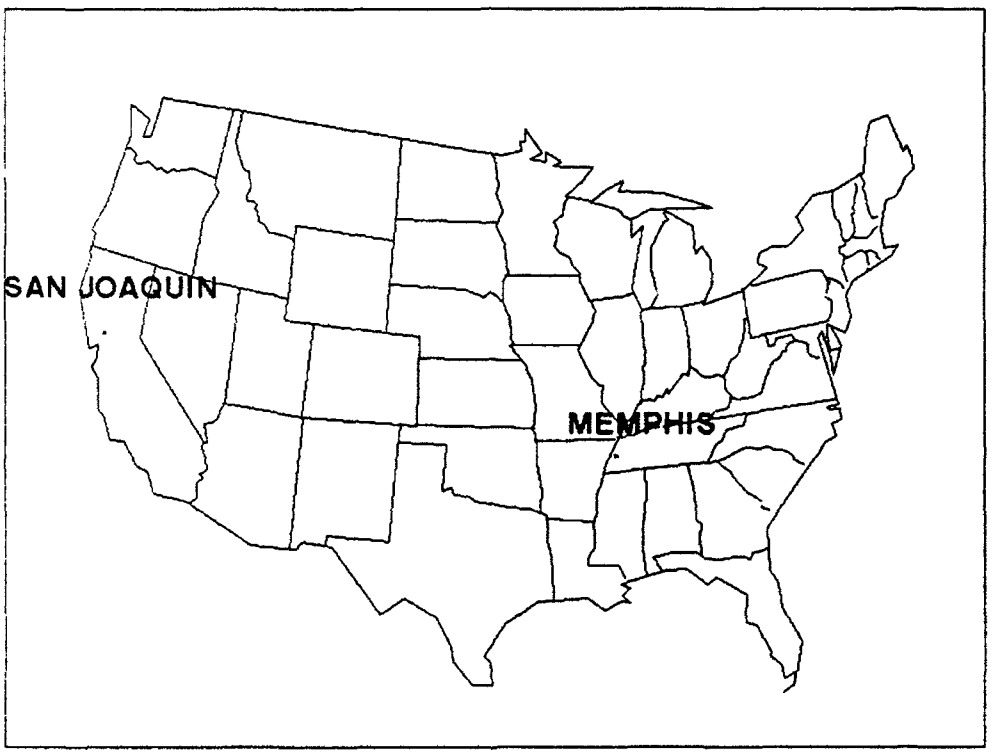


Figure 2-4. Reduced Storage Sites

SECTION 3
RESULTS

The study showed that the overall effect of the size reduction and standardization initiatives of DMRD 903 was minimal. This can be seen in Figure 3-1 which shows distribution costs for the historical system versus the system with simulated consolidation arising from size reduction. Further, the component distribution costs of transportation and warehousing showed very little variation. This was due to the small number of consolidations that took place for the customer order patterns and vendor shipment patterns.

Also, note from Figure 3-1 that warehouse handling cost was the dominant distribution cost component, accounting for approximately 90 percent of the distribution cost. Hence, the equation in Table A-1 to compute warehouse handling cost based on the numbers of MROs, receipts and returns could be used as a rough estimate of DLA's clothing distribution cost for any clothing NSN.

Additionally, the study determined that due to cataloging changes, the item manager's (IM) workloads had actually increased on selected clothing articles. This increased IM workload represents an additional cost burden to the supply center. This increased workload was not quantified at this time since it was outside of the original scope of the study. However, this situation was brought to the attention of DPSC staff during project reviews.

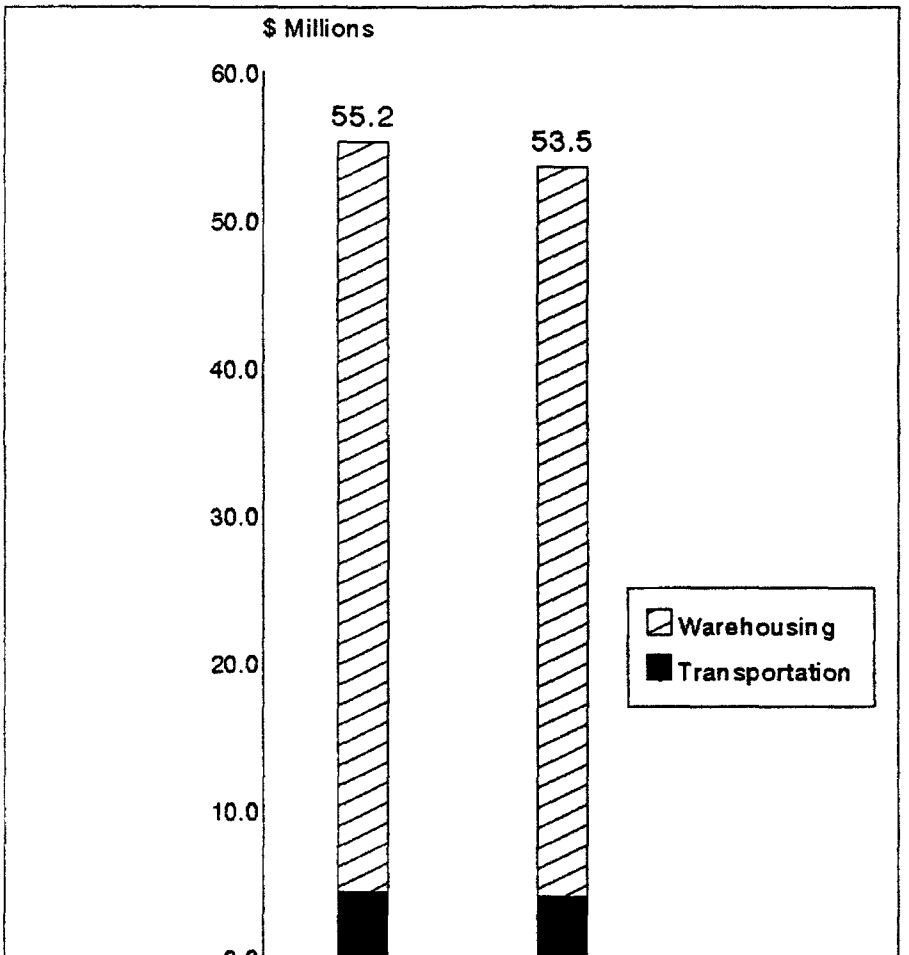
3.1 DEPOT COSTS AND WORKLOAD OBSERVATIONS

The warehouse handling cost was found to be the dominant cost factor in the overall distribution costs as shown in Figure 3-1. DLA averaged approximately 10 million dollars a year (FY92$) in warehouse handling costs for the PGCs affected by the size reduction and standardization initiatives.

The number of MROs and receipts did not significantly decrease after consolidation. Consequently the warehouse handling cost did not significantly decrease. The low number of consolidations imply that the MRO and receipts would have continued to occur separately for the replacement NSN even if the deleted NSN did not exist.

The visit to DDMT showed that depots may be able to decrease the time that it takes for them to fill the MROs associated with a requisition by more efficient storage of NSNs. The present system has numerous instances of the different sizes for the same PGC being stored in widely separated locations.

As the depot attrits a deleted NSN from its warehouse, it should strive to store all the remaining sizes of a PGC in the same general location. Within the PGC designated storage area, the depot could then arrange the individual sizes in accordance with their respective activity; namely, the more active sizes being more accessible to a picker than the slower moving sizes. Through implementing efficient storage of the different sizes of clothing articles, the depot will be able to reduce pick time and hence costs.

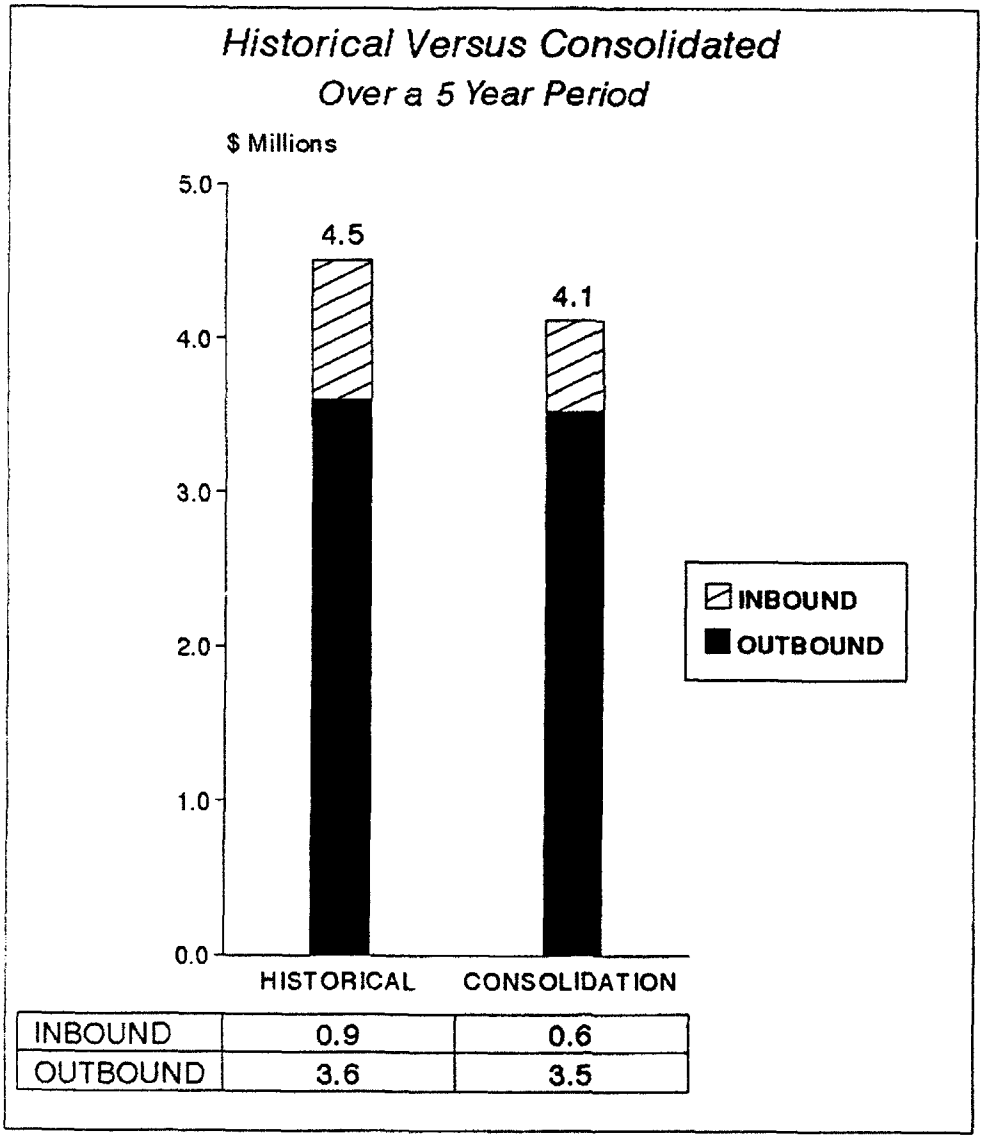


Warehousing	50.7	49.4
Transportation	4.5	4.1

Figure 3-1. Distribution Costs (over 5 yrs.)

3.2 TRANSPORTATION COSTS

Transportation cost also saw no significant changes due to consolidation as depicted in Figure 3-2. This was expected since it, too, is directly linked to the number of actions occurring, as was the warehouse cost. Without a significant consolidation of actions, there was not a substantial decrease in the number of shipments. If a significant degree of consolidation would have occurred, DLA could have gained the advantage of lower rates associated with weight break rates offered by transporters. However, this was not the case.



INBOUND	0.9	0.6
OUTBOUND	3.6	3.5

Figure 3-2. Transportation Cost Comparison

3.3 ITEM MANAGER OBSERVATIONS

Although it was outside the original charter for the study, the study team has developed insight on the IM workloads. This has resulted directly from the requirement to evaluate shipping and requisitioning functions for clothing articles. The study team found that DLA has issued new item catalogs in which the deleted item has been removed. Since it is stated policy to attrit the old items, when a customer now requisitions the new item, the IM must intervene manually and place a call to the customer to ask what item is actually required. This situation is depicted in Figure 3-3.

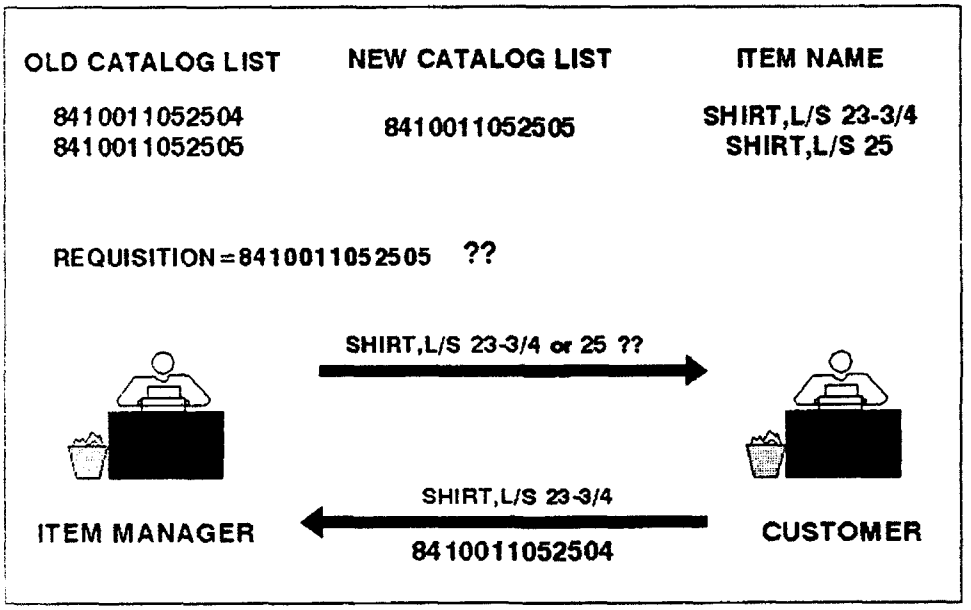


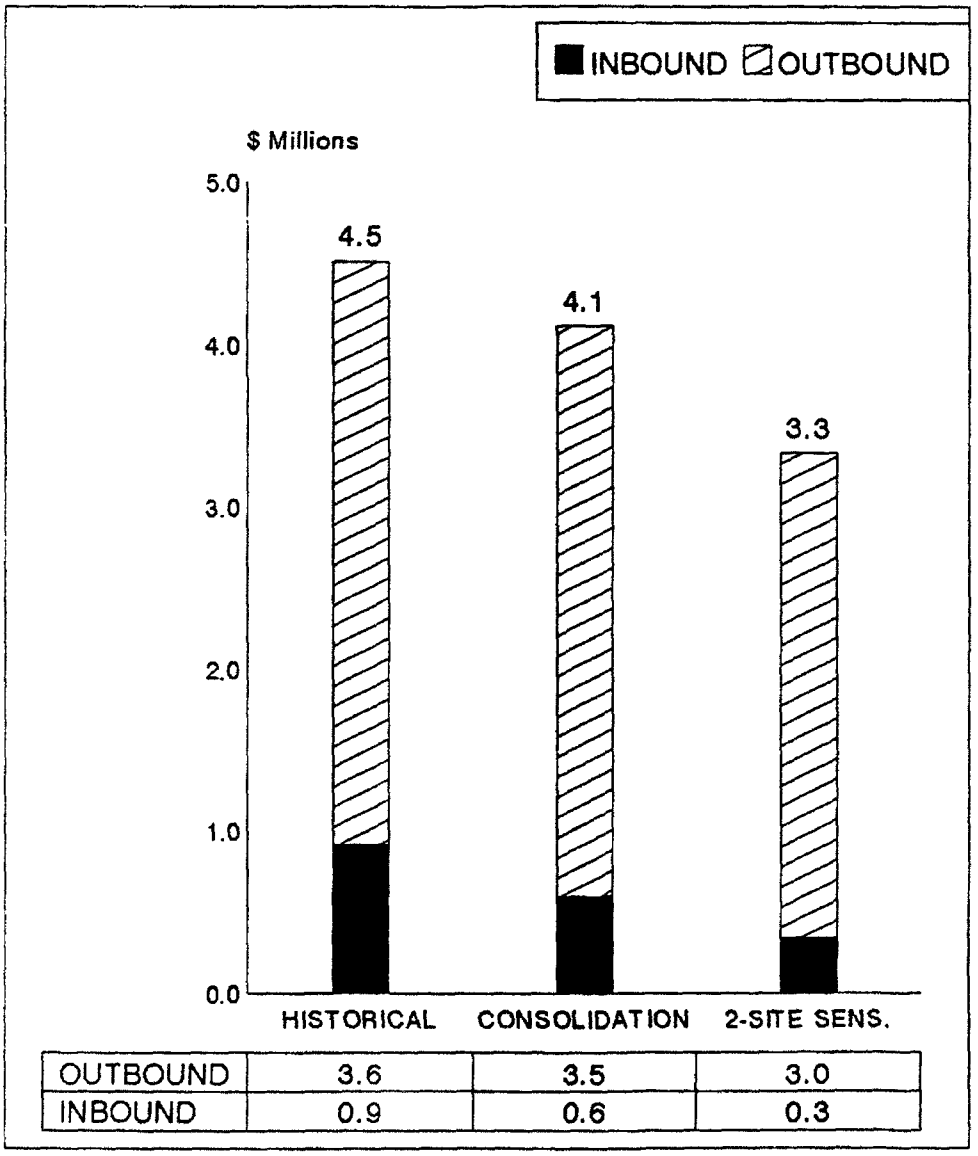
Figure 3-3. Work Flow Changes

In the depiction of Figure 3-3, the IM has received a requisition for a clothing article that is the replacement for a deleted article. The IM does know that the requested item is the replacement for the deleted item, but he must make sure that every effort to attrit the old item is made. Consequently, the IM must call the customer and ensure that the customer definitely cannot use the deleted item. Once the IM knows which item is required, he returns the requisition to the system.

The extent to which this situation occurs has not been quantified by this study since it was outside our original tasking. However, this situation clearly depicts additional workload on the IM. During the course of the study, the study team has presented this information to the supply center for their consideration.

3.4 SENSITIVITY RESULTS

A transportation sensitivity analysis was conducted to compare the historical system of seven depots (see Figure 2-3) using a "closest to customer" stockage policy with a reduced storage system. This reduced system would use two storage sites at Memphis and San Joaquin and would be based on a "closest to vendor" stockage policy (see Figure 3-4). In effect, the second system actually represented a single site storage system based in Memphis since all C&T vendors for the study population were found to be located in the eastern sections of the country. The two-storage site system with modeled consolidation is less costly than the seven depot system with consolidation and lesser still than the historical system. Both cost components, inbound and outbound, reflect this same trend.



OUTBOUND	3.6	3.5	3.0
INBOUND	0.9	0.6	0.3

Figure 3-4. Transportation Sensitivity Results (Over a 5 Year Period)

3.5 OVERALL PROJECTED SAVINGS

The overall projected distribution savings arise from the cost difference between the historical seven depot configuration and the seven depot configuration with clothing consolidation. This cost difference is shown in Figure 3-1 and is $1.7 million. Further, the sensitivity analysis showed that with a "closest to vendor" stockage policy and only two sites, the transportation savings would be $0.8 million greater. These additional savings stem from the transportation cost differences associated with the two depot configuration.

These projected savings are virtually all attributable to the size reduction initiative. The other initiative (i.e., standardization) had almost no impact on savings. This was in large part due to the relatively few items covered by multi-service agreements as of April 1992 (i.e., only thirty-three items).

SECTION 4
CONCLUSIONS

DLA's distribution costs for an item are directly related to the activity of the item. The more activity the item has (i.e., the more MROs or receipts it has), the greater DLA's distribution cost (see cost per action computation on page A-6). Although the size reduction initiative has deleted selected items from the system, the size reduction effort and standardization has also replaced them with other items. Also, since the deleted clothing articles will have stock on hand for a substantial time requiring continued management, in reality it is as if the item had not been deleted from the system. Thus, in many cases both the deleted and replacement item will both be actually managed for the foreseeable future.

4.1 COST BENEFITS

The cost benefits gained by DMRD 903's size reduction and standardization initiatives are minimal because of two factors; namely ordering patterns and excess stock.

4.1.1 ORDERING PATTERNS

The first factor impacting cost benefits is that though ultimately there are fewer NSNs managed by the depots, the distribution costs are based on several external factors; namely, the number of receipts and MROs occurring, the request priority, weight of the shipment, and distance the shipment travels. These external factors are not under control of the depots. Rather they are related to the ordering patterns of the customer and shipping patterns of the vendors which are not significantly affected by the number of sizes being managed. In actuality the shipping patterns of the vendors are subject to contract standards while the ordering patterns of the customers are based on their unit needs and reflect stock levels which they are capable of maintaining at their unit locations.

4.1.2 EXCESS STOCK

The second factor impacting cost benefits is due to the planned attrition of the stock-on-hand for all NSNs programed to be deleted. Until such time as the NSNs targetted for deletion are actually eliminated, the depots can not be expected to achieve significant benefit. Using FY 90 troop levels, it will be many years before stock levels are substantially reduced (see Figure 4-1).

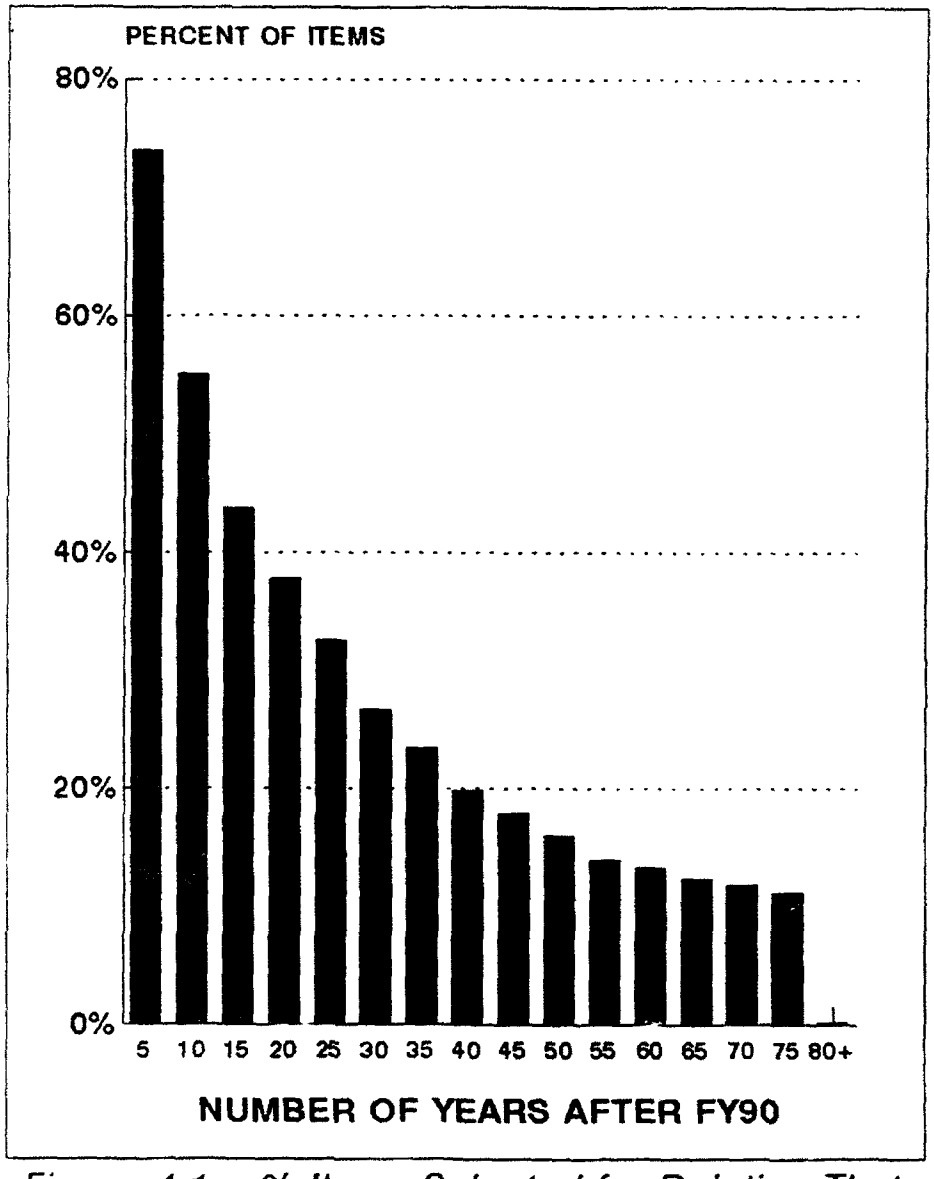


Figure 4-1. % Items Selected for Deletion That Still Have Stock-On-Hand

4.2 DEPOT WORKLOAD

As was discussed in subsection 4.1, there will be minimal change in the workload for the depots due to these initiatives. Although the deleted NSNs are being replaced by another NSN, in some cases it is an NSN that already exists, in other cases it is a new NSN. In both cases the customer will not have a decrease in the quantity of items that he will need given constant force levels.

One impact of this is that the depot will have to increase the quantity of the replacement NSNs they maintain to meet the customers' needs. This will at least partially offset the space gains obtained from deleting an NSN and eventually attritting the item from inventory. Also, unless the customer decides to increase the quantity of the replacement NSN that he maintains on hand, he will maintain the same ordering pattern he used in the past. This will lead to the depots handling the same quantity of MROs as in the past. There will be a similar affect for receipts since receipts are based on providing a certain quantity of a PGC to a depot. Unless depots accept increased quantities of a given PGC from a vendor, they may expect to have the same number of receipts as in the past (given constant force levels).

Lastly, as pointed out in subsection 3.1, the depots can reduce warehouse handling costs by pulling in all items of the same PGC to one area to reduce pick time. Further, highly active PGCs could be organized by making the most active items more readily accessible within the PGC's area in the warehouse.

4.3 ITEM MANAGER IMPACTS

The cost at the IM level within the supply center has seen an increase. This is a direct affect of the implementation strategy for the size reduction initiative. The IM has an increased requirement for manual intervention to ensure that a customer is receiving the item needed. Consequently, each time the IM intervenes there is an increase in the handling of the item which translates into an increased cost in labor.

SECTION 5
RECOMMENDATIONS

Actions can be taken in four areas to increase the savings from the size reduction initiative of DMRD 903. The four areas that DLA can affect are; warehouse layout, disposing of the deleted items, implementing cataloging improvements, and education of the customer.

5.1 WAREHOUSE LAYOUT

As stated in subsection 3.1, the depots may be able to decrease processing time through more efficient storage of NSNs. As the depots attrit deleted NSNs from their warehouses, they could store all remaining sizes of a PGC in the same general location. Within the PGC designated storage area, the depot could then arrange the individual sizes in accordance with their respective activity. Therefore, we recommend a depot storage location analysis be conducted on clothing articles to determine the economics of more efficient storage.

5.2 DISPOSAL OF DELETED SIZES

Although this analysis has been conducted with constant FY90 force levels, given the projected troop reductions, it may be more economical for DLA to dispose of the sizes selected for deletion by means other then attrition. With the stock-on-hand quantities and present ordering pattern of the sizes selected for deletion, the depots will have to continue managing them for several years beyond the 5 year savings period designated by DMRD 903. Any savings from having fewer sizes to manage will not be realized until the deleted sizes are actually out of the system. Additionally, there may be significant savings at the IM level from this action, since the IM would no longer have to call a customer to see which item was actually required; i.e., time savings would be achieved. Consequently, sending the deleted items to property disposal may result in greater savings being realized. Therefore, we recommend that an analysis be conducted to assess the economics of disposal for NSNs identified for deletion by DMRD 903.

5.3 CATALOG ISSUES

There is an increased IM workload arising from manual intervention with a customer. Communication between the IM and the customer for deleted items under the size reduction initiative is required since the old item has been deleted from the catalog. This additional intervention is required to ensure attrition of the deleted NSN. Therefore, we

recommend that an analysis be conducted to take a closer look at the impact of this situation. If a substantial impact exists, the recommended analytical effort might consider improved cataloging procedures to continue to carry the deleted NSNs in the catalog and to show the relationship between deleted and replacement NSNs. By carrying both the new NSN and the NSN programed for deletion, the customer could readily select the item which is required, and the IM would not have to call the customer.

5.4 EDUCATE CUSTOMERS

Customers at the unit level need to be educated to the fact that their ordering patterns appear to be one of the greatest factors in the distribution cost for an item. Making frequent orders of small quantities of an item greatly increases the handling and the cost of supplying the item. Use of more efficient requisitioning strategies would greatly enhance potential savings under the size reduction and standardization initiatives. We therefore recommend that customer ordering patterns be surveyed to actively assess customer requirements in determining whether more efficient ordering can be accomplished.

APPENDIX A

DEPOT WORKLOAD MODEL DEVELOPMENT

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A-1	Workload Factors Derived from DPSSO Manhour Standards and Depot Visit	A-6

Appendix A
DEPOT WORKLOAD MODEL DEVELOPMENT

The workload model for the depots was formed using three major data inputs. The first input was work standards from Defense Performance Standards Support Office (DPSSO). The standards provided by DPSSO are a listing for the six Defense Logistics Agency (DLA) depots of the actions that take place within the depot warehouses and the measured time standards these actions take. The second input for the model resulted from a site visit of the Clothing and Textile (C&T) warehouses at the Memphis, Tennessee depot. This visit provided insight as to the actions that take place in handling C&T items and how the majority of C&T items are handled. The third input for the model was a mapping of C&T receipts, material release orders (MRO), and returns provided by the DLA Operation Research and Economic Analysis Office (DORO) Depot Macro Analysis Program (DMAP).

The information on the number of returns, receipts, and MROs for each of the depots over a 1-year period was used to weight the time standards from DPSSO for each depot. These weighted times were combined to form the time standard formulas for conducting a receipt, return, and MRO. This information was also used to determine the ratio of returns to receipts to MROs.

The combination of these three factors formed the final computation of the time that was required to conduct returns, receipts, and MROs, as well as, their ratio to each other. These ratios were used for developing weighted workloads.

The same technique was used to determine the cost per hour to conduct these three tasks. The pay grades assigned to accomplish the tasks that are required for a return, receipt, and MRO was determined. Their pay scales were averaged together to determine the average cost per hour to conduct the tasks. The final figures are as depicted in Table A-1.

Table A-1. Workload Factors Derived from DPSSO Manhour Standards and Depot Visit

ACTION	TIME (hours)	COST/ACTION(FY89)*	RATIO to RECEIPTS (During 1 year)
MRO	4.235	$40.15	24.4:1
RECEIPT	4.336	$41.11	1:1
RETURN	0.286	$2.71	.682:1

*NOTE: Based on an average cost of labor per hour of $9.48

Consequently the average cost per action is obtained from the following formula which was used to determine the cost per year for an NSN to be handled within a depot:

$\$40.15\ x_i + \$41.11\ y_i + \$2.71\ z_i$ = Annual Distribution Cost ith NSN

NOTE: Where for the ith NSN x_i is defined as the number of MROs, y_i is the number of receipts, and z_i is the number of returns.

APPENDIX B

STANDARDIZATION INITIATIVE BACKGROUND

LIST OF TABLES

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Appendix B
STANDARDIZATION INITIATIVE BACKGROUND

This initiative focused on standardization across the uniformed Services. Currently, there exists many Service unique clothing and uniform articles. These would include items such as utility coveralls and undershirts. By having the Services agree on common clothing items, substantial savings can be achieved. Even though there were great expectations for cost savings in this area, the study showed very little savings for the clothing items under study. Table B-1 contains a list of the clothing and textile items phased out for standardization as of April 1992. This list was provided by the Defense Personnel Support Center (DPSC) and consists of only thirty-three items.

ITEM	NSNs	SPEC	TOTAL SOH/DI	MONTHLY DEMAND	MONTHS OF SOH/DI	PGC	MILITARY SERVICE	NUMBER NSNs
HOOD, ECW W/O EAR PODS	8415-00-472-4695	MIL-H-29101	11573	39	296.74	10240	CG/N	1
COVERALLS, MECHANICS	8415-00-753-6483s	MIL-C-41833	98393	2083	47.24	00462	A/MC	3
BELT, MP W/INSIGNIA	8465-00-559-5759	MIL-B-21154	2148	42	51.14	10152	A/MC	1
BELT, MP	8465-00-527-8843	MIL-B-21880	22881	1294	17.68	10332	CG/N	1
SUNGLASSES, GOLD	8465-00-753-6261	MIL-S-25948	0	385	0.00	20340	CG/N	1
SHOES, SAFETY	8430-00-926-6068s	MIL-S-41821	35152	2248	15.64	01509	A/CG	104
MASK, COLD WEATHER	8415-00-243-9844	MIL-M-43294	26829	1776	15.11	10260	A/AF/CG	1
HOOD, COLD WEATHER	8415-00-543-7130	MIL-H-25754	1144	1999	0.57	00347	AF/CG	1
MITTEN, ECW	8415-00-268-8312s	MIL-M-6269	38588	1272	30.34	00682	AF/CG	2
HANDBAG, NAVY	8445-01-265-6774	MIL-H-87072	34350	1840	18.67	20563	CG/MC/N	1
HANDBAG, ARMY	8445-01-026-5311	MIL-H-43981	37352	1334	28.00	10690	A	1
ANKLETS, BLACK	8445-01-056-9130s	MIL-A-29131	8021	1425	5.63	01975	AF/CG/N	2
APRON, UTILITY	8415-00-715-0450	A-A-50068	56745	2307	24.60	10144	ALL	1
UNDERSHIRT, CW	8415-01-285-0159s	MIL-U-43262	853715	26167	32.63	00402	A/CG/MC/N	6
DRAWERS, CW	8415-01-285-0153s	MIL-D-43261	375807	26750	14.05	00340	A/CG/MC/N	6
COVERALLS, EXPLO HNDLRS	8415-01-009-5305s	MIL-C-29111	0	0	0.00	00466	N	12
SOCKS, CUSHION SOLE GREEN	8440-00-782-2171s	MIL-S-48	2040213	371474	5.49	00305	A/MC	5
HOOD, RFH, BLACK CL 1	8415-00-753-6211	MIL-H-43079	170	1	170.00	10234	A	1
HOOD, RFH, WHITE	8415-00-889-3714	MIL-H-27614	238	1	238.00	10241	AF	1
COAT, ALL WEA MN BLK 385	8405-01-059-4225s	MIL-C-44030	38340	8003	4.79	02111	A	27
COAT, ALL WEA MN BL1600	8405-01-041-9763s	MIL-C-87110	54099	3496	15.47	00066	AF	27
COAT, ALL WEA WMN BLK 385	8410-01-005-6168s	MIL-C-43972	9250	1610	5.75	02110	A	24
COAT, ALL WEA WMN BL1600	8410-01-168-2210s	MIL-C-87170	41080	1313	31.29	01858	AF	27
COVERALLS,FLYER, CMU 27/P	8415-01-043-8376s	MIL-C-83141	264000	12125	21.77	00470	A/CG/N	24
COVERALLS,FLYER, CMU 27/P	8415-01-291-1227s	MIL-C-83141	28300	3054	9.27	02068	AF	26
GLOVES, WMN'S	8415-01-148-9121s	A-A-50355	43999	2020	21.78	00519	N	2
GLOVES,C&O PROT KNIT CUFF	8415-00-935-2833	A-A-50370	15552	846	18.38	10196	CG/N	1
COVERALLS, GP, OG 107	8405-00-131-6507s	MIL-C-2202	719144	24143	29.79	00334	ALL	5
COVERALLS, SAFETY, WHT	8415-00-782-6368s	MIL-C-43570	32732	1330	24.61	00481	A/AF/N	6
UNDERSHIRT, WHITE V-NECK	8420-01-194-0914s	MIL-U-44096	260795	31799	8.20	01892	AF/CG/MC/N	8
UNDERSHIRT, GREEN	8420-00-782-6708s	A-A-50013	1162840	77924	14.92	00401	MC/N	8
INSECT NET, HAT & NET	8415-00-082-5483s	MIL-H-38471	16473	42	392.21	00544	AF	6
GLOVES, HEAT PROT TERRY	8415-00-024-9505	MIL-G-82248	41695	20	2084.75	10187	CG/N	1

Table B-1. DMRD 903 Clothing & Textile Items Phased Out for Standardization

B-6

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The purpose of this project was to determine the effect on the distribution cost of the DMRD 903 size reduction initiative. The project analyzed the 3 year workload activity of those items that were selected for size reductions in order to develop the warehouse and transportation costs. This workload was then compared to the probable ordering pattern that would have been followed if the sizes were not available for ordering. The resulting difference in costs for the two ordering patterns represented the most favorable cost offsets for the size reduction initiative which the Defense Logistics Agency (DLA) could expect.

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