

AN ORGANIZATIONAL ANALYSIS OF THE
FULTON WAREHOUSE

by

Daniel D. McGeehan
Highway Research Analyst

Virginia Highway Research Council

(A Cooperative Organization Sponsored Jointly by the Virginia
Department of Highways and the University of Virginia)

Charlottesville, Virginia

June 1971
VHRC 70-R57

CONCLUSIONS AND RECOMMENDATIONS

This study was proposed on the assumption that people close to an organization can modify its existing programs and thereby make them more relevant to the specific needs of that organization.

The study has found that the Fulton Warehouse is a potentially progressive organization, but that it has a variety of inhibitors.

Because of the progressive attitude of the Warehouse management, many of the recommendations made here have already been implemented; others do not fall under the immediate jurisdiction of the Warehouse and may take time for implementation if in fact their adoption is desired by the management.

Personnel

1. Since the lowest personnel classification in the Warehouse attracts few people with the potential of becoming managers, and since this position is almost a dead-end one, it is suggested that the duties of the storekeeper porter position be incorporated, to the extent possible, into other classifications. Following this incorporation, the position should be used only when absolutely necessary.
2. Realistic qualifications should be set for existing job classifications and these qualifications should be future oriented. In other words, an employee hired into a foreman position should have the potential for moving up the career ladder.

Training

3. Some cross training between Fulton Warehouse and Central Purchasing personnel should be attempted. This training should include familiarization with specific jobs as well as general organizational goals.
4. The goals of the Fulton Warehouse should be reexamined and alternate structures should be proposed before the phaseout of the Warehouse superintendent position.
5. Performance standards and personnel standards should be set on functional units within the organization.
6. Personnel chosen from within the organization to be trained should be selected by actual job performance and potential rather than by formal job title.
7. An attempt should be made to train personnel for skills they will need as well as those they already require.

8. Because of the relationships the Warehouse personnel have with private companies, other state agencies and the districts, diplomacy, tact, and interpersonal relationships should be stressed in the training.

Inventory

9. The inventory procedures should be studied and the feasibility of establishing the value of inventory in relation to the quantity of inventory should be examined. Once this relationship has been established an audit procedure should be designed which would closely check the higher valued items and place less emphasis on the lower value items. This action should result in an adequate evaluation system that would require less time than the present system.
10. The bin cards used by the Warehouse for inventory purposes seem at first to be obsolete in relation to the new automated process. However, they are in practice a strong management tool that brings the manager closer to the other employees.
11. Minimizing obsolescence is the responsibility not only of the Warehouse but also of the Divisions; therefore, coordination between the Warehouse and the Divisions is essential.

Policy

12. Some policies in the policy manual are outdated and should be revised.
13. The policy manual is in general a vast source of knowledge, however, the divisions of knowledge (e. g. , policy, procedure, or general) are not well defined. It is suggested that the information in this manual be divided into three sections: first, a policy section not subject to frequent changes; second, a procedure section that should be revised at given intervals; and finally, some of the material in the manual would be useful in forming a training section.

General Organization

14. Because the responsibilities of the Warehouse extend into the districts and residencies, it is suggested that some effort be made to place a representative in the districts. It is further suggested that all purchasing responsibilities (e. g. , road stock, contract buying, inventory) be assigned to this representative.

15. As a stopgap or alternative to recommendation 14 (if implementation of 14 is not possible), it is suggested that an employee from the Warehouse or Central Purchasing be designated as a field representative.
16. It is suggested that increased service to other state agencies will probably have effects on the residencies within which these agencies exist. It is therefore suggested that any attempt to increase sales beyond normal obligations be weighed carefully in terms of future effects.

AN ORGANIZATIONAL ANALYSIS OF THE
FULTON WAREHOUSE

2741

by

Daniel D. McGeehan
Highway Research Analyst

The purpose of this study was to examine the Warehouse organization as an entity separate from the Purchasing Division. The examination focused on the organization internally and then on its relationships to other organizational structures.

When an organization is taken as an entity, the positions in it are significant in their relation to its day-to-day operations. For example, an employee who is responsible for keeping an accurate inventory of items worth thousands of dollars is a key figure in the Warehouse, he may even be considered a manager. However, in his relation to the Division itself this same man is low on the organizational chart; at the Department level he is lost. Therefore, in terms of this study, personnel who are participating in the functions of this small entity, either formally or informally, to a degree that they may be considered managers are classified as such.

Because this study considered an organization in a way unique to the Department two definitions are set forth.

Manager: The responsibilities of a manager, in terms of this study, are characterized by the word "change". The responsibility for change distinguishes this position from positions carrying more routine responsibilities and that are lower on the organizational ladder.

Executive: The primary function of an executive, by definition, is the execution of the policies and procedures of the organization. This position is usually higher on the organizational ladder than that of manager.

Although the functions of these two positions are not always clearly distinguishable, a manager more likely deals with unprogramed problems; that is, problems which are not anticipated and are seldom ever solved, but rather held in equilibrium.

HISTORY

Previous to World War I the highway equipment owned by the state was limited and repairs were made by blacksmiths on the work projects or by local shops. At the close of World War I, Virginia secured approximately \$1,500,000 worth of road building equipment from the federal government for the cost of transportation. On July 1, 1919, a shop was established at the State Penitentiary. This shop, staffed by a foreman and six workmen, was assigned the responsibility of assembling, maintaining, and repairing the newly acquired equipment.

In 1922, after the state had been divided into eight highway construction districts, and had acquired sufficient equipment to care for all maintenance and a large portion of the construction activities, suitable properties were bought and district shops erected.

The increase in the volume of equipment and the numbers of employees created a problem with the limited space allotted to the equipment function at the Penitentiary. Beyond the problem of space, was the problem of maintaining security with the added number of people passing through the prison gates.

On April 29, 1923, the Department of Highways procured the World War I Aviation Plant in East Richmond. Soon afterwards the Equipment Division was transferred to the Aviation Plant, where it is still located. The functions of storing, inventoring, and distributing supplies (i. e., those responsibilities now handled by the Purchasing Division Warehouse) were part of the function of the Equipment Division, and were, therefore, transferred with the Division.

The need for prompt and efficient purchasing of equipment, material and supplies, many times for emergency situations, prompted the establishment of what is now known as the Purchasing Division*, on November 1, 1922. At this time the purchasing function was the responsibility of a purchasing agent, a storekeeper, and a safety engineer. In 1924 the Warehouse function, then in the Equipment Division, was transferred to the Purchasing Division, where it is presently located.

The Purchasing Agent, at that time, reported directly to the Commissioner of Highways (see Figure 1), this was changed with the reorganization of 1964. In this reorganization, the four Director positions were established, and the Purchasing Division was placed under the Director of Administration.

* The Equipment and Purchasing function was not formally given Division status until after 1947.

The formal history of the Warehouse from its inception to its transfer from the Equipment Division to its present state of existence in the Purchasing Division is complete at this stage; but to better understand the workings of the Warehouse its informal transfer should be studied. Further, the implications of this transfer should be examined

Although responsibility for the Warehouse function was transferred to the Purchasing Division in 1924, there is some indication that the actual transfer of the inventory was not completed until 1948. In the Equipment Division's Annual Report to the Commissioner, 1937 to Present, it is stated that the inventory in the Equipment Division's Warehouse was reduced from \$1,568,715.27 on June 30, 1948, to \$9,488.78 by June 30, 1949. It is not clear if this inventory was depleted, transferred to the districts and residencies, or transferred to the Purchasing Division. It is clear, however, that by June 30, 1948 the Equipment Division still controlled \$1,568,715.27 in parts inventory. This implies that the transfer of the Warehouse was still not completed at this time.*

Further inquiry into the transfer of the Warehouse indicated that the definition of functions between the Purchasing Division and the Equipment Division, in relation to Warehouse activities, was obscure up until about 1966. The personnel of both divisions worked in the same physical area and all phone calls going to Purchasing personnel passed through the Equipment Division's switchboard.

It is easy to understand how an organizational entity formally related to a parent organization but geographically separated by a number of miles would tend to identify with another organization to which it is not formally related but is geographically attached. It is also rather easy to see how this entity — a part of a division headed by a Warehouse superintendent — would assume a secondary role to this other organization, a division headed by a division head.

It is the researcher's opinion that the secondary role assumed for the Warehouse function adversely affected the morale, efficiency and direction of the Purchasing Division's personnel in the Fulton complex. It is further believed that because this entity did not identify with the Purchasing Division the communications between the two were weak.

In 1966 the position of Warehouse Manager was established. This position served various purposes. First, it moved the top management position of the Warehouse closer to the top management position of the Equipment Division; thereby giving the entity a more nearly equal status with its co-tenant, the Purchasing Division. Secondly, the authority vested in this new position made possible better defined activities for the two organizations. Finally the upgrading of the top position in the Warehouse improved communications between the Warehouse and the Purchasing Division.

* Interviews with various Department personnel indicate that the personnel records were not transferred until 1948.

By 1967 the Warehouse had cut many of its ties with the Equipment Division. The assistant buyer, the main link between the Warehouse and the Equipment Division, was transferred physically to the Central Office. The Warehouse unit was given its own telephone switchboard, secretarial positions were established to support the Warehouse unit, and Warehouse personnel were physically separated from Equipment Division personnel. According to the Minutes of the Meeting of the Warehouse Staff on December 21, 1967, the organization was well accepted.

A thorough inspection of all facilities was made by the Commissioner and his party. The Commissioner took occasion to praise highly the renovation recently made, the splendid performance and fine morale of the employees, and the outstanding record made by the Warehouse.

It is the premise of the researcher that a study of this organization's history will give the potential manager in the organization an insight into its present problems and future direction.

Some of the important factors to be seen in this history are:

- (1) That the Warehouse originated in the Equipment Division.
- (2) That some of its ties with the Equipment Division were long in being separated.
- (3) That there are probably some ties still remaining and that they can influence any future actions.
- (4) That the fact that the Purchasing Division functions are being carried on in the districts and residencies by Equipment Division personnel is not unusual. This is probably an indication that the separation of the Warehouse from the Equipment Division is still not complete, and in fact, some of the responsibilities are still hazily defined.
- (5) That the problems created by this incomplete division in the past may present themselves again in a different area.

Positions and Functional Responsibilities

Table I is a listing of positions in the Warehouse as it appeared in the office files at the beginning of the study, and Table II shows the current listing.

TABLE I

LISTING OF WAREHOUSE POSITIONS — 1969

Position	Education	Approximate Time in in Department (Yrs.)
Warehouse Manager	13	25
Warehouse Superintendent	11	48
Storekeeper Supervisor "C"	11	14
Storekeeper Supervisor "C"	12	6
Storekeeper Supervisor "B"	12	16
Storekeeper Supervisor "B"	11	8
Storekeeper Supervisor "B"	12	7
Storekeeper Supervisor "B"	16	1
Storekeeper Foreman	8	15
Storekeeper Foreman	13	7
Storekeeper Foreman	11	25
Storekeeper Foreman	12	4
Storekeeper Foreman	11	6
Storekeeper Foreman	Not Recorded	
Storekeeper Assistant	16	4
Storekeeper Assistant	12	4
Storekeeper Assistant	11	13
Storekeeper Assistant	12	4
Storekeeper Assistant	Not Recorded	
Clerk Steno "C"	13	9
Clerk Steno "B"	12	2
Clerk Steno "B"	11	8
Clerk Steno "B"	13	5

Clerk Steno "B"	13	3
Clerk Steno "B"	13	7
Clerk Steno "B"	12	1
Equipment Operator	10	1
Equipment Operator	12	0
Equipment Operator	7	1
Storekeeper Porter	4	1
Storekeeper Porter	5	1
Storekeeper Porter	5	22
Storekeeper Porter	5	2

TABLE II

CURRENT LISTING OF WAREHOUSE POSITIONS

Position	Education (Nearest Year)	Approximate Time in Department (Nearest Year)
Warehouse Manager	16	13
Warehouse Superintendent	11	49
Storekeeper Supervisor C	11	15
Storekeeper Supervisor C	12	7
Storekeeper Supervisor B	12	17
Storekeeper Supervisor B	12	9
Storekeeper Supervisor B	12	8
Storekeeper Supervisor B	16	2
Storekeeper Foreman	8	16
Storekeeper Foreman	13	8
Storekeeper Foreman	12	26
Storekeeper Foreman	12	5
Storekeeper Foreman	12	7
Storekeeper Assistant	12	5
Storekeeper Assistant	12	5
Storekeeper Assistant	12	14

Storekeeper Assistant	11	14
Clerk Steno C	13	10
Clerk Steno B	12	3
Clerk Steno B	12	2
Clerk Steno B	13	6
Clerk Steno B	11	9
Clerk Steno B	13	4
Clerk Steno B	13	8
Equipment Operator	10	2
Equipment Operator	12	1
Equipment Operator	7	2
Storekeeper Porter	5	2
Storekeeper Porter	5	2
Storekeeper Porter	5	23
Storekeeper Porter	5	3

The statistical breakdown on these data is as follows:

	Total	Male	Female
Number of Employees	32	25	7
Mean Education	10.8	10.3	12.4
Median Education	12	12	13
Range in Education	4 to 16	4 to 16	11 to 13

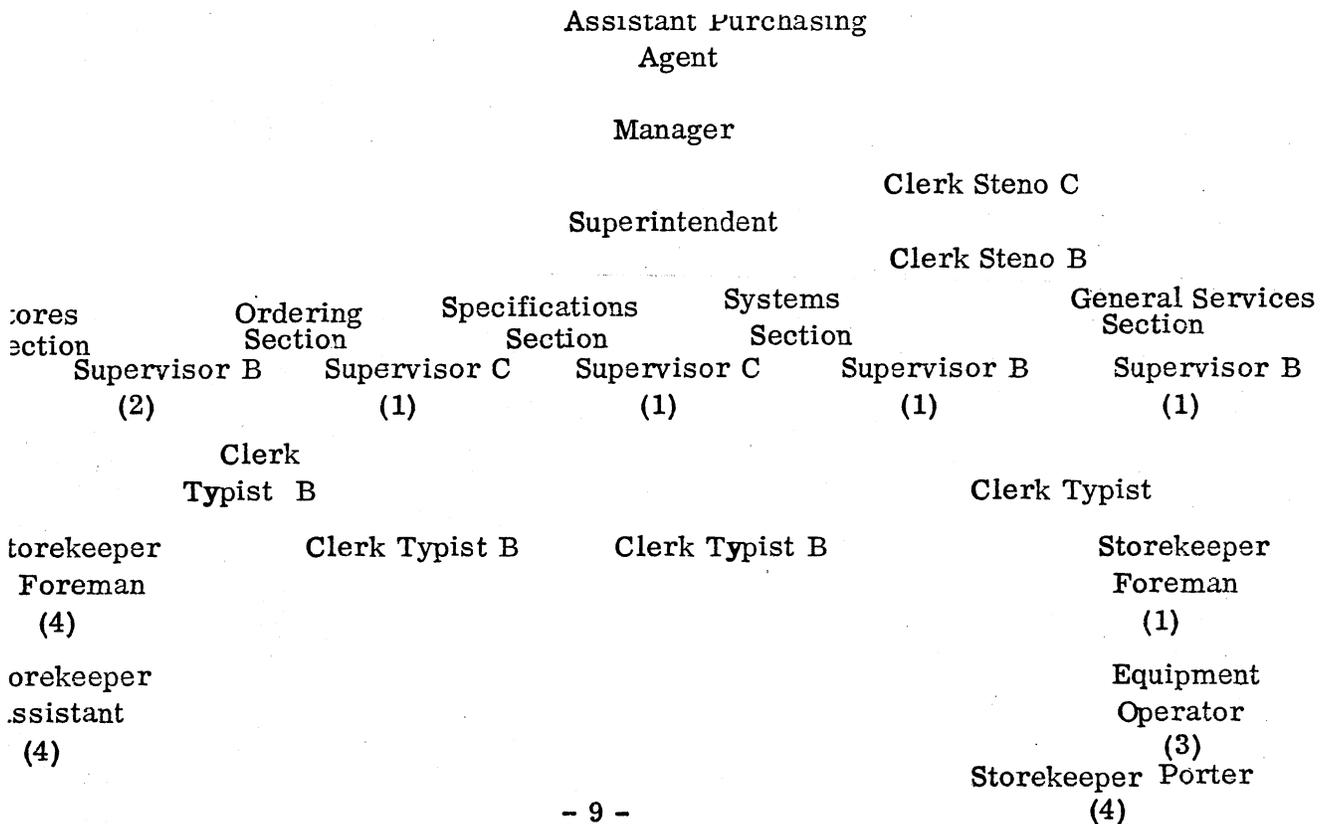
The pay scales for the Warehouse positions are listed in Table III, and the structure of the organization is given in Figure 2.

TABLE III

<u>Position</u>	<u>Monthly Salary</u>
Warehouse Manager	\$956-1250
Warehouse Superintendent	\$700-916
Storekeeper Supervisor C	\$536-700
Storekeeper Supervisor B	\$490-640
Storekeeper Foreman	\$430-560
Storekeeper Assistant	\$376-490
Highway Equipment Operator	\$376-470
Storekeeper Porter	\$288-360

Figure 2

STRUCTURE OF WAREHOUSE ORGANIZATION



From an examination of Tables I and II and Figure 2, a few inferences can be made. First, the organization cannot easily promote through the ranks, because of the following reasons:

1. The organization is relatively small.
2. The potential transfer for persons in upper level positions is somewhat limited due to their limited education; the warehouse manager and one supervisor B are exceptions.
3. The education of persons in the equipment operator and storekeeper porter positions, with few exceptions, indicates that these are dead-end positions.
4. Judging from the number of years of experience of the personnel in general, the career progression is slow.

It would seem that the Warehouse should recruit personnel at three levels of entry. First, at the supervisor level, persons recruited should be well educated and have experience (one offsetting the other to some extent). Second, at the level of storekeeper assistant or highway equipment operator, personnel should have good qualifications and potential but lack, perhaps, the formal education or experience for entry at the supervisor level. The third level of entry would be for persons in the storekeeper porter position.

The career ladder within the Warehouse could be improved by the establishment of more positions. This could be achieved if there were more opportunity for exchange of personnel between the Purchasing Division and the Warehouse.

There seem to be a number of inhibitors to this exchange of personnel:

1. The personnel in the parent unit, i. e. , the Central Purchasing Office, have little knowledge of the functions of the personnel in the Warehouse; this applies in the converse also. Therefore, an employee does not know what to expect in entering another position and he would naturally hesitate to give up the known for the unknown.
2. The types of duties performed by each unit are generally dissimilar (e. g. , operational vs. administrative).
3. Somewhat more abstract is the bias of one entity toward the other (i. e. , the feeling that one unit is much better than the other). This is probably a product of the knowledge gap mentioned in number (1) above. This bias could also be a residue from the past, (see Chapter 1).

Thus far the Warehouse personnel have been examined with respect to their job titles, pay scales and positions in the organizational chart. Next the duties of the units within the Warehouse will be examined. Figure 3 shows the Warehouse job classifications according to the 1969 organizational chart.

Figure 4 gives the most recent view of the unit activities. A comparison of Figures 3 and 4 shows a rather unrealistic job description for the system unit. The reason is that the job descriptions were built around the employees who in the judgement of management were capable of performing the tasks. Figure 4 shows a rather heavy duplication of effort by warehouse superintendent "B" and the other units. This duplication is the product of an effort to transfer the responsibilities of the superintendent position to others; this position will be phased out when the present employee retires.

The organizational chart of the Warehouse is scheduled to be changed in the not too distant future. The plan at present is to eliminate the position of warehouse superintendent when the employee presently in that position retires. It is the opinion of this researcher that other alternatives to this move should be considered. Although there are many implications to this organizational move, its objectives should be thoroughly examined. Is it being made for reasons of economy? Is it a way to reduce manpower? Will the result be efficiency?

In the following pages two alternatives to this move are examined. There are other modifications that could be introduced; however the two given will serve to point out the major issues involved in a change of this type. The alternatives will be compared in two ways: argument for and argument against, with a conclusion for each.

In order to develop alternatives to the move in question, an examination of the responsibilities of the units and personnel was made, the reason being that the shift of organizational "boxes" should be designed around functions and not personnel in the functional units. Observations from this examination are presented before the alternatives are discussed.

It is suggested that the time for reexamining the organizational structure is before the phaseout of the superintendent position.

In restating the structure of the Warehouse it is suggested that responsibilities be delineated on the basis of performance standards and personnel standards. Performance standards, as defined by Ralph Davis in his book The Fundamentals of Top Management, are, "Criteria of the results that should be obtained by the performance of designated functions as directed." In other words, standards are set on the basis of the results one wishes to obtain, and they incorporate quality and quantity measurements. These standards should not need frequent reviewing, their goals should be sufficiently short range so that the extent to which they accomplish their goals can be determined. Personnel standards (job requirements) are defined by Davis as, "Criteria of the characteristics and abilities required of individuals and groups for the proper execution of their normal work assignments". These standards may be the products of the performance standards as stated to meet a given objective and the number of employees needed to accomplish this objective must be calculated. Further the types of activities they must perform should be defined and the types of people needed to perform the activities should be specified. Unlike performance standards, personnel standards should be reviewed frequently. Because of additional experience gained by employees, turnover, etc., the standards may be affected.

<u>Stores</u>	<u>Ordering</u>	<u>Specifications</u>	<u>Systems</u>	<u>General Services</u>
1. Final inspection of commodities received	1. Research	1. Establish specifications	1. Research and administer operating procedures for entire warehouse	1. Shipping and receiving
2. Placement, inventory accuracy and dispersment of supplies and materials	2. Utilization of Equip. Rep. Parts Forecasting System	2. Research	2. Coordinate activities with field engineers and buyer personnel	2. Inspect incoming shipment
3. Work in harmony with ordering unit to utilize space	3. Ordering by scientific guidelines	3. Liaison (a) man rep. (b) purchasing (c) field personnel	3. Devising computer projects concerning: (a) inventory (b) contract tire records (c) equipment repair parts forecasting	3. Determination of shipment made
4. Reviewing all incoming requisitions	4. Anticipate field needs	4. Back-up for (a) ordering unit (b) systems unit	4. Analyzing reports and correcting computer errors	4. Operate courier service
5. Control obsolescence, assure proper utilization of available stock	5. Establish reorder levels, quantities		5. Administration of performance contracts	5. Training and directing forklift fleet
			6. Liaison with manufacturer's personnel field engineers, computer analysts, procurement officers	6. Supervise labor pool
			7. Warehouse safety program	7. Maintenance of building and grounds
			8. Personnel training programs and schools	
			9. Compiles all manuals (a) Operational safety (b) Forklift truck, etc.	
			10. Administer Central Warehouse invoice processing activities	
<u>Storekeeper Superintendent "B"</u>				
	1. Assist Warehouse Manager			
	2. Audit Supervisor			
	3. Review inventory			
	4. Recommends stock (a) additions (b) deletions			
	5. Assure availability			
	6. Prevent obsolescence			

Figure 3. Warehouse job classifications in 1969.

<u>Stores</u>	<u>Ordering</u>	<u>Specifications</u>	<u>Systems</u>	<u>General Services</u>	<u>Storekeeper Superintendent "B"</u>
1. Final inspection of commodities received	1. Research new techniques	1. Establish specifications	1. Research and administer operating procedures for entire warehouse	1. Shipping and receiving	1. Assist warehouse manager
2. Placement, inventory accuracy and dispersment of supplies & materials	2. Utilization of equipment repair parts forecasting system	2. Research into new techniques in field	2. Analyze computer reports and correct errors	2. Inspect incoming shipments	2. Audit supervisor
3. Work in harmony with ordering unit to utilize space	3. Set ordering by latest scientific guidelines	3. Liaison with (a) manufacturing representative (b) purchasing personnel (c) field personnel	3. Conduct ongoing safety program	3. Determination of shipments to be made	3. Review inventory
4. Review any incoming requisitions	4. Anticipate field needs	4. Back-up for (a) ordering unit (b) systems unit	4. Conduct personnel training programs and schools	4. Operate courier service	4. Recommend stock (a) additions (b) deletions
5. Minimize obsolescence assure proper utilization of available stock	5. Establish reorder level guidelines	5. Monitor and control computer projects concerning: (a) inventory (b) contract tire records (c) equipment repair parts forecasting	5. Compile all manuals (a) operational safety (b) forklift, truck, etc.	5. Training and directing forklift fleet	5. Assure availability of stock
	6. Coordinate activities with field engineers and buyer personnel	6. Administer performance contracts	6. Administer central warehouse invoice processing activities	6. Supervise labor pool	6. Minimize obsolescence
	7. Maintain liaison with manufacturers, field engineer, computer analysts and procurement officers to insure adequate quality			7. Maintenance of building and grounds	

Figure 4. Present Warehouse job classifications

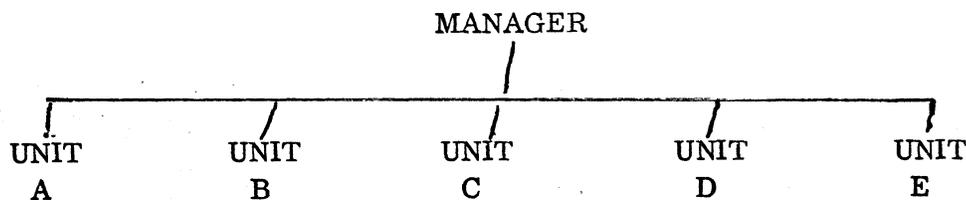
Specific observations from the examination of the responsibilities of units and personnel are as follows.

- (1) The objective of the Warehouse has not been spelled out (i. e. , it has not been stated whether the objective is to serve the Highway Department or the Purchasing Division in such-and-such a manner).
- (2) The duties of positions in the Warehouse not presently filled have not been spelled out, e. g. , those of the supervisor "A". It should be noted that this position exists in the Districts and Equipment Division and is not on the Purchasing Division's payroll nor under its supervision.
- (3) The job descriptions spelled out in the Warehouse records combine unit responsibilities and personnel responsibilities. It is suggested that these be separated and that the unit responsibilities be spelled out in detail. It is suggested that the classifications for supervisor A, B and C be spelled out in general. In other words, an employee in the supervisor "C" category should have the knowledge, skill, and ability to carry on certain general activities which make him adaptable to supervisory "C" work in other units.
- (4) There are a number of duplications in the job descriptions and the responsibilities of one category are assumed by employees in another category, see Figure 3.

Therefore, it is suggested that before alternatives to any organizational move are considered, the job classifications should be tightened. For example, all research should be conducted by one unit, liaison with personnel outside of the Purchasing Division should be the responsibility of a given unit, etc.

Once these unit responsibilities are determined a number of alternatives to the elimination of the position of warehouse superintendent could be considered. Two possibilities are given below.

FIRST ALTERNATIVE



In this alternative the very basic move is made, i. e. , the position is eliminated. No other structural changes have to be made; however, work assignments would have to be redefined to fill the gap.

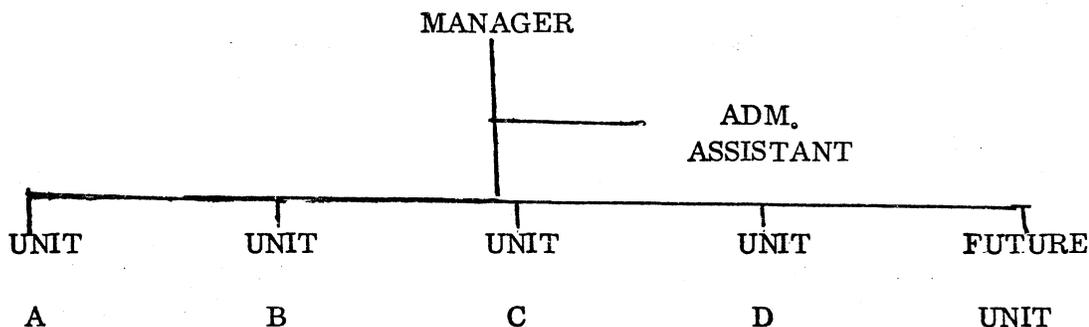
Arguments For

- (1) It is economical; money saved will be \$11,000 plus 24.4% annually.
- (2) It will save manpower; fewer people will do the same amount of work.
- (3) It will provide direct communication between the supervisors and the manager.
- (4) It will force an interdivisional exchange of personnel, but only one way. If a person is to progress "through the ranks", he must spend time in Central Purchasing.

Arguments Against

- (1) The career ladder will be interrupted; the jump from supervisor to manager is too great. Once an employee reaches supervisor "C", he has reached a dead-end unless he is willing to work in Central Purchasing. As pointed out earlier, this is seldom the case.
- (2) The manager will have no assistant, and therefore would be directly responsible for all the supervisors. When the manager would be absent, one of the supervisors would have to be designated as the manager's representative; the situation could cause morale difficulties.
- (3) This chain of command, which is lower than that of the Central Office, could denote an inferior entity within the organization.
- (4) In this alternative, the organization must stay with the built-in problems it has; by using another alternative, a more viable structure would be possible.

SECOND ALTERNATIVE



This organizational structure is described in some texts as an infant organization. If one considers the birth date of the Warehouse to be 1924, it is not infant; however, if birth is defined as "coming into its own," then the birth date would be 1966.

This alternative drops the position of warehouse superintendent and reassigns the functions of Units A through E to four units. The overflow of functions from the unit consolidation plus certain supervisory duties of the superintendent can be given to the administrative assistant. This model leaves room for any future units.

Arguments For:

- (1) It is only somewhat less economical than the first alternative; i. e. , one position is still vacated.
- (2) The warehouse manager will have an assistant, one who is defined as such and not "acting".
- (3) There is room for expansion.
- (4) There is only one level through which communications must travel.
- (5) Responsibilities must be condensed into fewer units, and thus overlapping responsibilities would be eliminated.

Generalized Duties of the Warehouse

The personnel of the Fulton Warehouse are constantly in contact with agencies and people outside of the Highway Department. Some activities in the Warehouse require contact with manufacturers, other activities require contact with other state agencies, and it is possible for the personnel in the Warehouse to come in contact with the general public in doing their work.

Some of the employees have responsibilities beyond their job descriptions. They act for the manager when he is absent, negotiate with manufacturers' representatives, represent the Warehouse in the field, and manage personnel in the Warehouse. Many times the job of the "would be" manager in the Warehouse is more difficult than that of actual classified managers at higher levels. Many of the people in the Warehouse performing manual tasks need detailed supervision. If one is to instill job responsibility and pride in individuals at the lower end of the organizational ladder, he surely must possess management skills.

The Warehouse employee is unique in another way; he may be called on to be responsible for a larger dollar volume of inventory than his counterparts in other units. An example is the employee responsible for the electronics storeroom in the Warehouse.

The contacts that many personnel in the Warehouse may have imply a type of management skill not provided for in the average training program. This is a skill of managing persons above and below you in the chain of command, and those over whom you have no authority.

Employee Morale

Observation and interviews have shown that morale in the Warehouse is extremely high. The personnel seem to exhibit a high degree of unity and cooperation in their work.

The employees seem to be closely allied to their top management, even to the point that the attitude of the top management is reflected throughout the organization. When employees were interviewed in early 1970 they reflected a rather aggressive and confident outlook in the performance of their jobs; the warehouse manager at that time was experienced, successful, and therefore confident. The employees now show a lesser degree of confidence and appear to be more considered in their work approach; they have a new manager, one apparently well qualified, and with much seniority with the Department, but new in the ways of the Warehouse.

Although this high morale is generally good, it has a few drawbacks. A new employee must "prove himself" before he is accepted. This does not appear to be easy to accomplish and a young person may be frustrated and even incapable of gaining acceptance. The selection and supervision of new employees require the close attention of the manager. A second problem that possibly may arise relates to security. At present security procedures seem to be adequate; however, because of the trust employees have for one another it may begin to slacken. It must also be noted that this trust is not extended to strangers in the area.

CHAPTER III

INVENTORY

The inventory of the Warehouse comes under the broad heading of highway equipment stock. However, this is not as homogeneous as one might think. The inventory is composed of stock that has high turnover, stock that has very little turnover, stock of low value, and stock of relatively high value. To add to this list of variables, there is stock which is pilferable and stock which presents no problem in this area.

To account for this inventory, the Warehouse utilizes a number of procedures. First, they keep a perpetual inventory; second, a cycle inventory. (See Manual of Instructions — Purchase and Stores Division, July 1968 p. 81.) Within the last two years an automated system of inventory control has been introduced into the highway supply system. This system is now being implemented by the personnel in the Fulton Warehouse. The system is new to the Department and has not been introduced in all districts. Its advantages appear to be great and will probably increase as it becomes more polished. The researcher is of the opinion that study of this system, other than to gain basic knowledge, would not be wise at a time when the problems of implementation are still arising. One problem found in this stage is that of communications between the districts and the Warehouse. For example, when the researcher visited the residencies to gain information as to how the new system was affecting them, it was found that stock was being placed on the floors rather than in storage racks, which had ample room. When the researcher reported this to the Fulton Warehouse, representatives were sent out to the residencies and the problem was soon corrected (Appendix I). This problem is only one which has occurred but is representative of what can be expected in the future because of the unusual chain of command set forth in Chapter V.

One of the most important parts of the inventory control system is the bin card. This card is a simplified record of additions and deletions that is kept in or near each stock bin. By use of this card, a supervisor can at any time make a spot check inventory of an item. If a mistake is found, the type of error, e. g. , shipping, receiving, mathematical, etc. , can be found and most likely the date it occurred. Without this card the manager and supervisor of the Warehouse would not be as close to the inventory process, which because of the entry level of some personnel (see page 10), is essential.

The frequency of inventories appears to be more often than is desirable; however, it would seem that this decision should be the option of the warehouse manager, who is directly responsible for the accuracy.

The level of control of inventory is set at 100%, which appears to be a bit unrealistic; at some point, dollars are evidently being spent to account for pennies. The emphasis in inventory control is placed on errors (i. e. , number of items under or over limit set). This is undoubtedly an important part of inventory control;

however, more important is the monetary factor involved. In other words, there should be no doubt that 10 errors on a \$10 item are more important than 10 errors on a \$1.00 item. The inventory check is taken with the following assumption: If the sample taken of the stock is representative and 10 errors are found in the sample, ten errors across the board are implied. This concept would seem to be sound in a universe where all items were homogeneous but in a heterogeneous universe the concept of a random sample is subject question (see Appendix II for audit report).

There is an alternative solution based on the assumption that 20% of the inventory accounts for 80% of the stock. Therefore, if emphasis were placed on the high valued items, e.g., electronic equipment and scotchlite, and the cost of the low valued inventory, i.e., nuts and bolts, spread over the entire inventory, the accuracy, money wise, would probably be higher with less effort.

The problem of maintaining an accurate nuts and bolts inventory is to a large extent a money problem. For example, much of the time of one employee is spent breaking down costs on bulk invoices to be recorded by unit price. This task could be eliminated if this item were taken off the automated inventory system. The need for replenishment of this item could then be determined by bin card alone.

There are other problems in the inventory section, such as excess of obsolete material, apparent overuse of some items, and unsuitable packaging of incoming items (nails).

The excess of obsolete items comes basically from two sources. First, since the Warehouse deals with many products but at different times of the year, due to open bidding, it is at times holding parts for equipment that has been phased out, i.e., 1970 Fords vs 1971 Plymouths. This problem is being dealt with through the tracing of inactive items or items for machinery which is being phased out. The automated replenishing system supplies this information. The second source of obsolete items is other divisions, which order special equipment and fail to coordinate their plans with the Warehouse. In this latter case items have become obsolete because equipment has been phased out in the divisions or specifications have been changed.

The obsolete items are, at given times, sold at public auctions. It is suggested that this auction process be extended beyond its present scope; that is, that the advertising be extended to other states.

The records of the Warehouse show that some items, for example, chain saws, ice coolers, etc., have turnovers seemingly in excess of normal usage. The use may be justified, but if it is not much money may be saved in a control system for these items. Other states have devised a "recall system" on such items which the Purchasing Division might look into. This system would determine the amount of usage of a given

item and then require the return of damaged parts to justify replacements. Adoption of this system by the VDH Purchasing Division may be difficult because of the chain of command not extending into the districts and residencies.

The inventory, when considered broadly, includes the road stock, stone, guardrails, etc. At present, the responsibility for this stock is somewhat hazy. It is possible that this responsibility could be assigned to the Purchasing Division, but without direct representation in the districts and the residencies this arrangement seems unrealistic. Generally, the inventory system in the Warehouse seems to work very well for accuracy; however, the inventory policies, as some other policies, appear to be overly defensive. These types of policies do not seem to be peculiar to the Warehouse or the Purchasing Division. They are likely to show up in any purchasing or fiscal unit, the types of units constantly under scrutiny and almost certain to be pinpointed in an organizational study.

The reasons for overly defensive policies (e. g. , 100% accuracy requirement of inventory, multiple checking of invoices, frequency of inventory audit) are easily understood, but there is a danger also. Overly cautious methods may slow down procedures, they may require excess personnel, and they may require that personnel spend their time inefficiently; in general, they can be costly.

A case in point will illustrate some of the problems mentioned thus far. Items such as nuts and bolts are received at the Warehouse and their corresponding packing slips are sent to the Warehouse accounting office, where personnel in the office break the items down to reflect the packaging in the Warehouse. At later dates the invoices for these items also arrive in the accounting office and are also broken down in accordance with Warehouse packaging. The invoices are matched with the packing slips and in general checked for accuracy. These are then sent to the appropriate unit of the Purchasing Division main office for further checking and payment. Generally, this is the procedure followed for most items received in the Warehouse. In this particular case (items of little value) the time spent processing appeared to outweigh the value of the items. Also, in this case, and more specifically in the case of more expensive items, any time spent in double checking inventory prices could cause payment to be delayed beyond the discount date.

In the case of items such as nuts and bolts (low cost items in large quantities) it is suggested that they be taken off the automated replenishment system and controlled by bin card. Also their cost should be dispersed over the entire stock, which would cut down processing time, expense, and the need for excess inventory. The need for replenishment can be calculated from history (taken from bin cards) and orders placed at regular intervals. This procedure was suggested by personnel in the Warehouse and may well be in effect to some extent at this time.

POLICIES

A performance audit has been defined as an examination and analysis of methods of operation to determine if an organization's actual operations are following established policies and procedures. This definition points out the importance of having up-to-date policies and procedures, for without them it is difficult to gauge the progress of an organization.

In general the policy manual for the Warehouse appears to be a well written, well organized document. However, at the time of this study it did appear to have some outdated references. For example, when spelling out methods of inventory, reference is made to the Kardex, which no longer exists. The Bulk Fuel Section is also obsolete.

Other parts of the manual are not in keeping with the actual organizational structure. The manual states (page 70, No. 5) that "Each residency office must maintain a record of all FOB purchases of material for comparison with the delivered prices to job site by the supplier. This record must show location of the job, length of haul, the quarry from which purchased and the normal delivered price for that area." Also page ii, entitled "Functions of Purchase and Stores Division," states, "It is also the responsibility of this Division to maintain stockrooms at the eight construction districts, the forty-five residencies, the Fulton Central Warehouse at Richmond, and the Hampton Roads Bridge Tunnel." This statement implies that the Purchasing Division has formal authority reaching into the districts and residencies, which according to the organizational chart is not the case.

The policy manual does not clearly describe the goals and objectives of the organization (both long and short range). Such a description would seem important to the understanding of the organization by all personnel.

The descriptions of inventory are in such detail that they suggest procedures rather than policy. It seems possible that the present manual could be divided into two sections. The first section could define generally the policies of the Division; the second part could be formed into a procedure and training manual. In this manner the policies of an organization are stated clearly and broadly enough not to need frequent changes. The procedure manual can therefore be changed to fit organizational innovations which would allow the policies to be stable and give an air of concreteness to the organizational structure.

The policy manual deals with people in various places rather than with functions, e. g. , pages 35 to 41. By addressing itself to people rather than functions, the manual is subject to change at any time a policy is deemed invalid. Frequent review is required to keep policies up-to-date.

It is therefore suggested that the policy manual be revised. The revision should include a division between policy and procedures, general updating, and a coordination between policy statements and Division capabilities. It is also suggested that procedures should be reviewed frequently enough to keep the manual up-to-date

THE WAREHOUSE AS A COMPONENT OF THE
VIRGINIA DEPARTMENT OF HIGHWAYS

The Warehouse has a unique relationship with the rest of the Department, as shown in Figure 5. The responsibility and accountability of the unit take it into all facets of the Department; however, the authority given to the unit via the chain of command stops short (see Figure 6).

Figure 6 typifies divisional representations in each district and in some residencies. This arrangement provides for some type of decentralization (although authority for final decisions is centralized), for better communications, and thus for more efficient service throughout the Department. In the case of the Purchasing and Stores Division, contact with the districts and residencies must be made through the Equipment Division (possibly a result of the incomplete separation of activities mentioned in Chapter I). This interrupted line of command results in the duplication of activities at the district level, a problem which once existed in the Warehouse but is no longer evident. The lines of communication are not well established between the Warehouse and the districts, which limits the extent to which the Warehouse can learn of problems in the field. Among other problems, this broken chain of command inhibits the use of techniques which could be applied by the Warehouse to gain more effective control of stock (e. g. , a recall system).

The responsibilities of the Purchasing and Stores Division in the field are extremely important. It is suggested that the assignment of an employee to the districts specifically for carrying out the duties of the Purchasing and Stores Division would not be extravagant and would result in improved efficiency. Such a person could be responsible for contract buying, road stock inventory, and the liaison between the parent unit and the district engineer, among other duties. During the conduct of this study a number of district equipment superintendents and district engineers were contacted. The general question of how the Purchasing Division in general or the Fulton Warehouse in particular could improve their service to the districts was asked. Almost without exception the quality of service received now as related to that of five years past was rated as superior. However, most of the district engineers voiced concern over the delay in receiving repair parts. On the other hand, this delay is anticipated by the equipment superintendents and they did not mention it until asked specifically about it.

Presently the Warehouse has excellent relationships with the districts and residencies but this is on an informal basis and could be subject to change.

The introduction of the automated replenishing system gives top management a tool to reach into the districts; however, the effective operation of this tool requires cooperation and communication, which could be greatly aided by a direct chain of command.

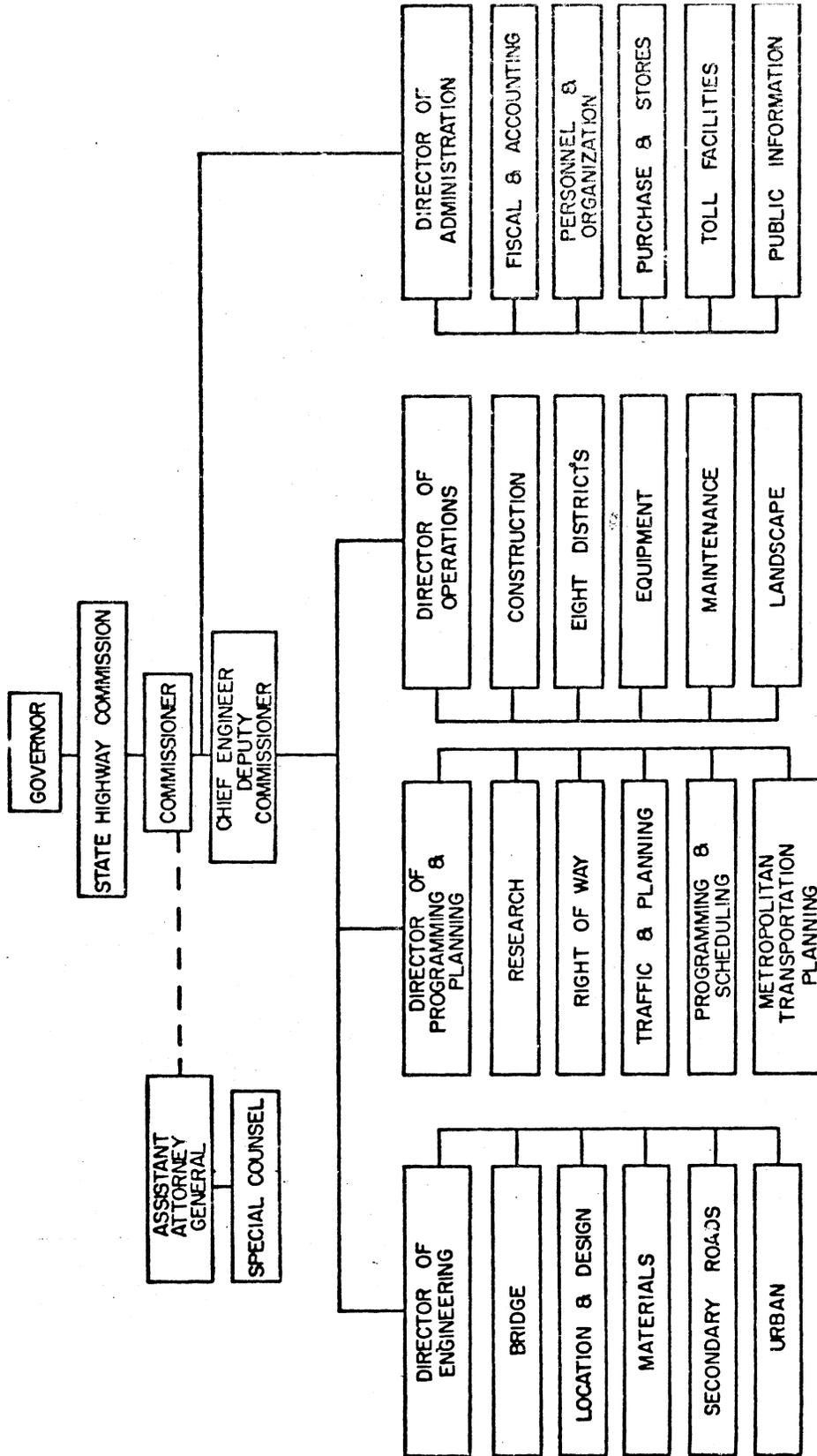
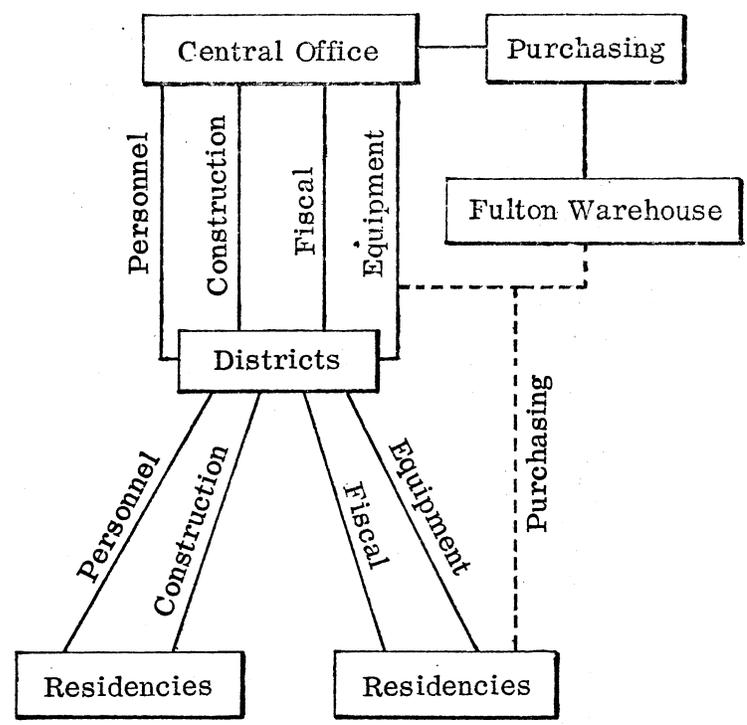


Figure 5. Department of Highways organization chart --- April 1, 1970.



———— Direct - - - - - Indirect

Figure 6. Direct communications vs. indirect communications.

CHAPTER VI

WAREHOUSE RELATIONSHIPS WITH OTHER AGENCIES

The Purchasing Division and thus the Fulton Warehouse have obligations which reach beyond the Department. The Division has an obligation to supply other state agencies with automobiles, trucks, and automotive equipment. The full extent of this obligation is not easily understood, nor is it clearly spelled out in the policy manual.

A brief examination into the problems of maximizing service to other state agencies was undertaken (refer to Appendix "III" for list of agencies served).

The knowledge of other agencies about the availability and types of equipment that could be obtained from the Warehouse was questioned. As a general rule this information was not well understood. The top management of the Warehouse had suspected that a lack of communication may be a source of limited purchasing by other state agencies and had asked for suggestions to correct this problem. Although increased orders from other agencies to the Warehouse may help to reduce overhead and actual solicitation may promote orders, there are problems which would be encountered.

The first problem is not new by now — the lack of Purchasing Division representation in the field. Increased purchasing by other agencies would almost surely result in more activity at the district and residency levels. There would be a need for a closer liaison with these agencies than is now obvious. There would also be a need for stocking items at the residency level that are not stocked there now. Some districts and residencies were interviewed about the possible effects of increased activities with other agencies. About half of those interviewed said that the added activity could be absorbed by existing personnel; the other half stated that they could not handle a significant increase with present conditions of personnel and space.

The original idea suggested by Warehouse management was to service these agencies from the Warehouse, but it is the conclusion of this researcher that the activity would soon reach the district and residency levels.

One other suggestion stemming from this examination is that the catalogue presently issued by the Purchasing Division be revised to make it more understandable to other agencies. The revision should include provisions for illustrations. The expense of the revision must be weighed.

It is suggested that any move to increase services to other state agencies be carefully weighed in terms of future effects.

The policies of the Purchasing Division, stated or not, have been to fulfill its obligation to other state agencies as efficiently as possible. The activities referred to in this chapter are over and above the formal obligation.

REFERENCES CONSULTED

2793

Studies

1. Report of the Commission for Economy in Governmental Expenditures, Senate Document No. 8, Commonwealth of Virginia, Department of Purchasing and Supplies, 1959.
2. Commonwealth of Virginia, Research Study of Administration Practices and General Procedures in the Virginia Department of Highways, Philadelphia Worden & Risberg Philadelphia, 1965.
3. Virginia Department of Highways, Management Self-Study, Report of the Steering Committee, 1970.

Reports

1. Virginia Department of Highways, Sixteenth Report of the State Highway Commission to the Governor of Virginia, July 1, 1922 through June 30, 1923.
2. Seventeenth Report of the State Highway Commission to the Governor of Virginia, July 1, 1923 through June 30, 1924.
3. Thirty-sixth Report of the State Highway Commission to the Governor of Virginia, July 1, 1946 through June 30, 1947.

Documents

1. Annual Reports of Equipment Division, Virginia Department of Highways, 1937 to present.
2. Minutes of Staff Meetings, Fulton Warehouse, 1966 to present.
3. Minutes of Staff Meetings, Purchasing Division, Virginia Department of Highways, 1966 to present.
4. Personnel Records, Fulton Warehouse, 1948 to present.
5. Pay Roll Records, Fulton Warehouse, 1948 to present.

APPENDIX I

SAMPLE OF CORRECTIVE MEMORANDUM
(COMMUNICATIONS PROBLEM)

2795

MEMORANDUM

To - District Engineers

Attention - District Equipment Superintendents

As a result of computerizing Purchase and Stores inventory, the residencies experienced a delay in processing stock received from the district storeroom. In some cases, incoming materials and supplies are allowed to "pile up" on the stock room floor for several days until the E. D. P. transfer report is received from the computer section in Richmond. Needless to say, this condition is burdensome to field personnel and increases the probability of stock handling errors.

In order to eliminate this unnecessary delay, stock received in the residencies from district storerooms should be processed as follows:

1. Immediately upon receipt of stock, residency personnel will check each item against their traveling requisition Form PA31R for correctness.
2. All items received correctly should then be stored in the proper bin or other established commodity location.
3. The transaction should be recorded on bin card Form PA34 showing the new balance; however, the date received will be left blank.
4. Upon receipt of the E. D. P. transfer report, in the residency, the actual date received will be inserted on the bin card.

Issues of stock which are necessary prior to receipt of the E. D. P. report will be handled in the usual manner. Issue report, Form PA36 however, will be held in a pending file until such time as the actual receiving date is recorded on the bin card. Form PA36 will then be transmitted, with other

District Engineers
Page 2
December 8, 1970

daily work, to the computer section in Richmond. At the time of issue, the correct balance of stock on hand should be shown on Form PA36.

These instructions should be implemented immediately; therefore, we would appreciate your instructing all district personnel responsible for handling Purchase and Stores stock accordingly.

Signed

T. Ashby Newby
Purchasing Agent

FBL:bjw
CC: Resident Engineers

APPENDIX II

SAMPLE OF INVENTORY REPORT BY AUDITORS OF PUBLIC ACCOUNTS

<u>Cat. No.</u>	<u>Description</u>	<u>Short</u>	<u>Over</u>
17-01350	Screws Set Chuck 50121	7	
18-00275	Attachment Plug 2 Wire	3	
18-06300	Drill For Rawl Plugs #10		3
21-00250	Grease Mineral Gear SAE 90		360
22-00025	Axe with Handle #3	2	
22-00050	Axe with Handle #4		3
22-02400	Cutters BS Cold Chisels 1 1/2	1	
22-02775	Drill HSSS 1/16		32
22-03450	Drill HSSS 17/64	1	
22-03650	Drill HSSS 33/64	3	
22-06150	Hinge Strap 902 - 4IN		10
22-07725	Pliers Fence & Stapler Puller 10IN	1	
25-01600	Bushing M 42346		1
26-01750	Ring Stop 1156	3	
26-01775	Plate Ledger For Guards 1162		50
26-03025	Knife Head 1883		1
39-00600	Iron Angle 3/8" x 2" x 2"		20'
39-00825	Iron Angle 1/2" x 4" x 4"		20'
39-02625	Iron Angle 1 1/4"		20'
29-03400	Steel Cold Roll Sq. 7/8"		20'
39-03425	Steel Cold Roll Sq. 1"	12'	
41-00250	Joint Univ. Sweeper Broom 6217		1
44-03651	Tube 670 x 15 TR 13 Stem		11
44-04175	Tube 1000 x 15		1
47-00675	Brush Carbon Steel 3/4" head 1/4" Stem	1	
47-02800	Ratchet Socket 1/2" sq. Drive	1	

<u>Cat. No.</u>		<u>Short</u>	<u>Over</u>
28-00550	Paint Orange Equipment #30 5 gal. can		15
29-06675	Nipple Black Pipe 3" x 3 1/2"		2
29-06950	Pipe Black 3"		42'
29-07350	Plug Black Pipe 3/4	2	
29-07450	Plug Black Pipe 2"	1	
29-08175	Tubing Copper 3/4" x 20		40'
29-08525	Union Galv. 1 1/4		1
30-00150	Boot 3/4 Length Rubber # 11	2	
30-00175	Boot 3/4 Length Rubber # 12		2
34-00625	Extinguisher Fire DC 5 lb		4
34-00650	Extinguisher Fire DC 10 lb.		1

<u>Cat. No.</u>	<u>Description</u>	<u>Short</u>	<u>Over</u>
27-01000	Eradicator Ink		1
27-01723	Label Fanfold File Blue	3	
27-01825	Label Fanfold File Salmon	1	
27-03450	Pointer Pencil		12
27-03525	Remover Staple		4
27-05200	C-10 Form Change Order State Co. & Fed Proj. Order		1
27-05675	CR6 Permit	2	
27-06400	KD-21 Preventive Maintenance Guide		2
27-13100	TL-58 Log Sheet For Core Drilling Operation		1
00-00875	Graphite Tube For Locks	1	
04-00150	Plate Clutch Pressure Dodge 361433	10	
04-00175	Disc Clutch 382559		10
07-00780	Blade Windshield Wiper PRL 16	2	
07-01200	Cable Battery 19 in.		2
07-01800	Clamp Assembly Muffler 2 1/4	20	
07-01825	Clamp Assembly Muffler 2 1/2		19
07-03675	Fluid Brake		20

LIST OF AGENCIES SERVED

	CODE
ACCOUNTS, DEPARTMENT OF.....	151
ADVISORY COUNCIL ON EDUCATIONAL TELEVISION, VIRGINIA.....	126
ADVISORY LEGISLATIVE COUNCIL, VIRGINIA.....	104
AGING COMMISSION ON THE.....	135
AGRICULTURE AND COMMERCE, BOARD OF.....	301
AGRICULTURAL FOUNDATION, VIRGINIA.....	307
AIR POLLUTION CONTROL BOARD, STATE.....	422
AIRPORTS AUTHORITY, VIRGINIA.....	176
ALCOHOLIC BEVERAGE CONTROL, DEPARTMENT OF.....	999
APPLE COMMISSION, VIRGINIA STATE.....	308
ART COMMISSION.....	130
ARTS AND HUMANITIES, COMMISSION ON THE.....	148
ASSOCIATION FOR THE PRESERVATION OF VIRGINIA ANTIQUITIES, FORT HENRY BRANCH.....	920
ASSOCIATION FOR THE PRESERVATION OF VIRGINIA ANTIQUITIES, HANOVER COUNTY BRANCH.....	936
ATHLETIC COMMISSION, VIRGINIA.....	239
ATLANTIC RURAL EXPOSITION, INCORPORATED.....	929
ATLANTIC STATES MARINE FISHERIES COMMISSION.....	409
ATTORNEY GENERAL.....	141
AUDITING COMMITTEE OF THE GENERAL ASSEMBLY.....	103
AUDITOR OF PUBLIC ACCOUNTS.....	133
AUTOMATED DATA PROCESSING, DIVISION OF.....	137
BAR EXAMINERS, STATE BOARD OF.....	233
BAR, VIRGINIA STATE.....	117
BEAUMONT SCHOOL FOR BOYS.....	713
BEEF CATTLE COMMISSION, VIRGINIA.....	317
BLAND CORRECTIONAL FARM.....	718
BLUE RIDGE COMMUNITY COLLEGE.....	291
BLUE RIDGE SANATORIUM.....	603
BOARD FOR COMMUNITY COLLEGES, STATE.....	261
BOARD OF AGRICULTURE AND COMMERCE.....	301
BOARD OF BAR EXAMINERS, STATE.....	233
BOARD OF CONTRACTORS, STATE REGISTRATION.....	243
BOARD OF DENTAL EXAMINERS, VIRGINIA STATE.....	224
BOARD OF EDUCATION, STATE.....	201
BOARD OF ELECTIONS, STATE.....	132
BOARD OF EXAMINERS IN OPTOMETRY, VIRGINIA STATE.....	226
BOARD OF EXAMINERS OF NURSES, STATE.....	227
BOARD OF FUNERAL DIRECTORS AND EMBALMERS, VIRGINIA.....	225
BOARD OF HEALTH, STATE.....	601
BOARD OF MEDICAL EXAMINERS, STATE.....	228
BOARD OF PHARMACY, STATE.....	229
BOARD OF REGENTS, GUNSTON HALL.....	417
BOARD OF WELFARE AND INSTITUTIONS, STATE.....	701
BOON AIR SCHOOL FOR GIRLS.....	712
BREAKS INTERSTATE PARK COMMISSION.....	420
BRIGHT FLU-CURED TOBACCO COMMISSION, VIRGINIA.....	309

(Appendix III continued)

BUDGET, DIVISION OF THE.....	122
BUREAU OF BANKING.....	172
BUREAU OF INSURANCE.....	173
COLLEGE OF WILLIAM AND MARY IN VIRGINIA	204
CORPORATION COMMISSION, STATE.....	171
CORPORATIONS, DEPARTMENT OF.....	171
DEAF AND THE BLIND, THE VIRGINIA SCHOOL FOR THE.....	218