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GROUP LAUNDRIES
and their operation

PUBLIC HOUSING ADMINISTRATION

HOUSING AND HOME FINANCE AGENCY

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A. INTRODUCTION

Previous studies requiring interviews with 1,000 and more tenants revealed that the great majority using group laundries reported dissatisfaction with operation and equipment. The principal problems reported were: (1) inadequacy of clothes driers and insufficient time allowed for drying; (2) automatic washers out of order; (3) lack of proper storage space for tenant-owned machines; (4) insufficient number of periods allowed for large families who must wash more than one period weekly; (5) difficulties in adherence to scheduling; and (6) distance from units to laundries.

To obtain the extent and degree of seriousness of these problems it was necessary to study the equipment and operation of a number of group laundries and discuss in detail laundry problems with regional maintenance supervisors, local housing authorities, housing managers, maintenance superintendents, management aides concerned with scheduling, and tenants.

B. THE SCOPE OF THE STUDY

To determine laundry problems a study was made of 35 projects with 514 group laundries, the majority of which had group drying yards. These 35 projects, representing 26,500 units, are located in 4 of the 5 regions. Project size varied from 200 to 3,500 units, but obviously not all units in all projects were serviced by laundries. Sixteen of the projects were of the apartment type only; 10 were combinations of apartments and houses or apartments, houses and flats; and 9 were houses or houses and flats. Thirty-two projects were PHA-aided, 2 were war housing and 1 was State financed.

The selection of projects for the study was based on project size, types of units serviced by laundries, climatic conditions, projects reported to have unusually efficient equipment or operating techniques, or both, and on the use of distributor-owned machines.

To obtain complete information, it was necessary to confer with tenants as well as regional, local authority, and housing project staffs, and 272 tenants were interviewed. This would appear to be too small a sample, except for the fact that tenants in each project reported practically identical problems.

Since each project with the exception of the State financed, has several laundries, general information on equipment and operation was obtained for all laundries in the project, but one typical laundry only in each project was intensively studied.

C. DETERMINATION OF THE NUMBER OF UNITS REQUIRING GROUP LAUNDRY FACILITIES

Among the planning problems revealed by the study was the difficulty in determining the number and size of laundries for the number of units in a project. Such determinations must necessarily be made in the planning stage of the project where new projects are to be built; they should also be considered in remodeling laundries and adding to equipment. To determine the number of group laundries, the amount of laundry space and equipment, the following requires consideration: (1) units without sink-trays; (2) units without inside drying facilities; (3) units without outside drying yards; (4) family use of commercial facilities; and (5) climate and local atmospheric conditions.

1. Units Without Sink-Trays

Of the projects studied, but 65 percent of the total 26,500 units were equipped with sink-trays. This low percentage was not due entirely to the large number of apartment type units included in the study, since 62 percent of the apartments and but 70-75 percent each of the flats and houses had sink-trays. It was apparently assumed when these projects were built that the provisions of group laundry facilities would justify the elimination of unit trays, reduce unit condensation and save a little capital cost. Due to the long distances from many units to laundries, tenants' inability to have as many washing periods as needed and the inadequacy and insufficiency of equipment, particularly drying equipment, a great many tenants wash some laundry in units, tray or no tray. An analysis of scheduling shows that it is extremely difficult in most of the projects studied, particularly for families with children, to obtain group laundry facilities as frequently as needed. Children's clothing becomes dirty quickly and with few clothes, the frequency of need for washing is increased (see page 6). Families report that even though facilities were adequate requiring no waiting time, and laundries were reasonably nearby, they would wash some clothes in units and use the laundry for major washings. This arrangement was reported due to the problems of leaving children at home. Tenants also report a strong preference for doing all laundry in units, were it possible to equip units with necessary laundry facilities.

It is recommended that all units of future projects be equipped with at least a sink-tray per unit regardless of the availability of group laundry facilities.

2. Units Without Inside Drying Facilities

The units in but 6 of the projects where some type of inside drying is needed are equipped with inside drying facilities - five of the apartment type with bathroom driers and one of the group house type with hooks provided in kitchens. Neither is satisfactory. They

limit considerably the use of bathroom equipment and kitchen space, neither of which can be spared in public housing projects. In projects where inside drying is needed a large portion of the year, families must depend upon group laundry drying facilities unless satisfactory space or inexpensive mechanical equipment can be provided within the unit. Tenants who require inside drying facilities find it easier to do the major portion of their washing as well as drying at the group laundry rather than to carry wet clothes from units to laundries. More laundry would be dried in group laundries if laundry driers were more satisfactory.

3. Units Without Drying Yards

Families living in units without drying yards, although sink-trays are provided, require group laundry facilities. The majority of such families use group laundry equipment for the most of their laundry. Group drying yards usually are located adjacent to group laundries and the use of the complete group laundry equipment simplifies the laundry process. A few projects have provided additional group drying yards throughout the projects for families requiring drying facilities only. This is very satisfactory providing the yards are sufficiently close to the units to eliminate the carrying of wet clothes long distances.

4. Family Use of Commercial Facilities

Only 9 percent of the families who have access to group laundries send all or practically all of their laundry to commercial laundries. This includes the number using wet wash facilities. This portion of the families does not require the use of group laundries. Another 9 percent send a portion only of their laundry to commercial laundries but use project laundries for the remainder. This group must be provided for in planning group laundry requirements.

The use of wet wash facilities is dependent both on cost and habit. A number of families state that by combining their wash with that of other families, and thus obtaining reduced rates, washing can be done cheaper than with coin-operated machines. Families using wet wash were principally those who lived in units with bathroom driers.

In determining the number of families for new projects that will require group laundry facilities, it will be impossible to deduct the 9 percent of families using commercial facilities, since the number will doubtless vary for each laundry in the project. In adjusting equipment for existing laundries the percent using commercial facilities can be determined and should be considered.

5. Climate and Local Atmospheric Conditions

Climatic conditions affect the provision of laundry facilities, since in some areas inside drying is needed practically the entire year. Although unit drying lines are provided in some of these projects,

their use is limited and families must depend chiefly on group laundries. This same need exists in localities where soot and dirt make outside drying practically impossible.

6. The Effect of the Installation of Coin-Operated Machines on Laundry Use

A few families living in units with complete laundry facilities expressed a desire to use group laundries for the sole purpose of using the coin-operated machines. In a number of projects any family living in units equipped with laundry facilities is permitted group laundry use. The planning of new group laundry facilities for such families is not recommended. Because row house families with units completely equipped with laundry facilities happen to be living in a project with group laundries for apartment house families without such facilities does not justify the provision of new laundry facilities for the purpose of machine use only. However, in existing projects where adequate group laundry facilities are available such use can be justified.

7. Summary of Planning Factors

In increasing space and equipment of existing laundries or in planning for new laundries in new projects, the determination of the number of units to be serviced should be based on the conditions listed below.

a. Existing projects. In existing projects with project layout and units completed, the following factors should be considered in determining the number of units requiring group laundry facilities:

(1) The number of units without sink-trays;

(2) The number of units without inside drying facilities in areas where outside drying is impracticable a large portion of the year, even though unit outside drying lines are provided;

(3) The number of units without outside drying lines, such as apartments in climates and areas where outside drying is possible the major portion of the year, unless group drying yards are provided for these units easily accessible to the units; and,

(4) The percent of families who send all laundry to commercial laundries and who do not require group laundry facilities.

b. New projects. In new projects where units should be more adequately equipped with unit laundry facilities, such as sink-trays and, if possible, inside unit drying, the following factors must be considered in determining the number of units requiring group laundry facilities:

(1) The number of units in projects where the types of units such as apartments, do not permit unit drying yards, unless satisfactory inside unit drying can be arranged;

(2) The number of units of all types located in areas where climatic conditions prevent outside drying practically the entire year, unless satisfactory inside unit drying can be arranged;

(3) The number of units of all types in specific areas where atmospheric conditions prevent outside drying, unless satisfactory inside unit drying can be arranged.

Due to difficulties in solving group laundry problems and their cost of operation, it is recommended that such facilities be reduced to a minimum by equipping insofar as possible, units with adequate laundry facilities.

D. DISTANCE TO LAUNDRIES

In aided projects, the maximum distance to be traveled by families using laundries to the nearest laundry approximates 500' for apartment type units and 800' for group houses. Distances for the majority of families living in apartment type projects ranged from 40' - 250'; for projects with houses and flats from 50' to 400'. These distances, in most instances, are not by paved walk, which would be considerably greater than by the "cut across" methods, which are the most commonly used.

In 7 projects, laundries were located in the same buildings as the families using them which reduced distance; however, some of these families must re-enter the laundry from an outside door.

Problems of distance cannot be measured by lineal feet traveled only, since the majority of laundries have a number of entrance steps. Problems of distance accompanied by 2 or 3 stair flights for those families living on second and third-floor apartments add to the problems of laundry access. Additional problems of access are created in those projects with such topography that many steps are required before entering the laundry location. In a number of projects, ramps have been used to laundry entrances instead of steps. These add to the convenience of the tenant where a number of steps are required. In a few projects in northern areas, low riser steps with hand rails have been provided in the center of the ramp. This combination step and ramp is recommended in cold climate areas for safety, since accidents have been reported due to icy ramps.

The number of trips to the laundry reported by tenants adds further difficulties to problems of access and distance. Nearly half the families report 3 or 4 trips to the laundry for each washing period. About 10 percent report more trips and the remainder, fewer. The number, in some instances, is not only due to the amount of wash, but the necessity of carrying tenant-owned machine parts to units to prevent loss. The

number is also due to looking after children left at home. Many families set machines for the half-hour period and return to the unit during the machine operating period to look after children. Distance from units to laundries is a real problem for those families who have small children left in the units.

In 12 of the 35 projects, managers strongly approve a laundry in each building. This would not only decrease distance but it would improve tenant maintenance. Where fewer families use each laundry tenant responsibility for maintenance can be more easily enforced. Also less tenant friction results. Both lack of tenant responsibility and tenant friction are at present major problems, particularly in large laundries. With increased tenant responsibility, these 12 managers believe maintenance would be less and scheduling problems would be fewer. But one local authority believes scattered laundries result in higher maintenance costs and are not so satisfactory as fewer laundries and centralized equipment. The remaining managers made neither negative nor positive reports. In an area where inside drying is required the entire year, due to soot and dirt, the local authority recommends one laundry in each building for apartment house families who are not provided with inside drying in units and one central laundry for group house families who will probably never own washing machines. The great majority of managers strongly recommend adequate unit laundry facilities to reduce the need insofar as possible for group laundry facilities.

Laundry locations based on tenant requirements should not exceed 150' from the exit of the buildings housing the families. Preferable locations are in the same buildings as the families using the laundries.

E. LAUNDRY EQUIPMENT, AREAS AND DRYING YARDS

As previously stated, 1 laundry in each of the 35 projects was intensively studied to determine the adequacy of amount and efficiency of equipment for the number of families serviced.

The amount of equipment is not only dependent upon the number of users or the number of units, but on the frequency of weekly use.

1. Frequency of Weekly Use

The great majority of families interviewed reported they required more periods than were provided. Forty-three percent of all families, regardless of family size, require laundry use once weekly; 46 percent, 2 times weekly; 10 percent, 3 times; and 1 percent, more than 3 times weekly. Each 100 families require 169 periods of use or each family 1 2/3 periods. Laundry size and equipment should be provided accordingly. Where laundries are scheduled, periods should be established according to frequency of need as well as number of families. Unscheduled laundries should also provide adequate facilities to meet the periods per week required. Frequency of need cannot be met only by providing a few more periods for the largest families, as is the practice for a number of laundries. For instance, this study shows:

number in family	percent of families requiring various periods			
	1	2	3	more than 3
2 and 3	72	25	2	1
4 and 5	29	56	15	
6 and over	17	63	20	

The periods reported needed by families show more than one-fourth of small families require more than 1 washing period weekly, and a greater percentage for larger families. One of the significant problems in operation is the lack of provision of adequate periods of use due to: (1) inadequacy in amount and inefficiency of equipment to permit required periods; and, (2) insufficient information on actual family requirements.

2. Laundry Trays

a. Number of trays. The number of laundry trays for the laundries studied show some with 1 double tray for each 5 families using the laundries; some with 1 for each 10 families; and, some with 1 for each 17 families. In many laundries, some trays were idle.

The need for trays has been greatly reduced with the installation of those coin-operated machines designed to rinse clothes and drain through the floor drain. No tray is needed for rinsing and draining. However, with group laundries equipped only with these types of machines, some trays should be included, since a few families use trays for spot washing. Based on tenant requirements, one pair of trays should be installed for each laundry, with 3 machines or less. In large laundries 1 pair of trays should be installed for each 3 machines, or 1 for each 50 families using the laundry. Since the new trend for a number of makes of machines is toward the automatic type, planners of future laundries with these installations can reduce the number of laundry trays to the above requirement. Existing laundries with inadequate space and equipped with automatics only should remove superfluous trays to provide necessary space.

Laundries equipped with non-automatic machines require 1 double tray for each machine or 1 tray for each 14 families, since trays are required for rinsing and many families use them for soaking clothes. This ratio takes into consideration the number of periods required for families (see page 6) and a 72 hour week for laundry use. About 12 percent of the families using group laundries own their own machines and use them in the laundry. Since these machines are of the non-automatic type also, 1 tray is required for each 14 families. It is doubtful that tenant-owned

machines will increase in number for group laundry use. In fact, the number is expected to decrease since tenants report quite a number of machines out-of-order with repair costs too high for tenant expenditures. It is difficult to prognosticate in the planning stage for laundries the number of tenants that will own their own machines, since more than one-half the laundries evaluated had none. However, this will not affect the number of trays to be installed except in laundries where automatic machines are in use.

Based on the above, with a 72 hour weekly laundry operating period, the following number of trays are required for each 100 families using laundries:

Laundries equipped with	automatic machines only,	2	double trays
" " "	automatic machines, and with 12 percent of tenants owning machines	3	" "
" " "	non-automatic only,	7	" "
" " "	non-automatic, and with 12 percent of tenants owning machines	7	" "

b. Tray material. About half of the trays were concrete. Others were composition, alberene, slate, enamel, ceramic and soapstone. In a few projects a number of concrete trays have been replaced because of cracking. One project reported ceramic unsatisfactory due to difficulties in keeping clean. Enamel, slate, alberene and soapstone were all reported satisfactory.

c. Tray arrangement and free operating space. The majority of trays are arranged with fronts adjacent. This is space saving and entirely satisfactory to tenants. Those trays arranged with a shelf between the fronts, a 12" width is adequate, provide a much needed place for soaps and soap powders and relieve floor clutter.

Where laundries must provide for tenant or coin-operated machines requiring trays for rinsing, trays with fronts adjacent require at least 10' of unobstructed free space between backs of trays. This permits machines and operating space. Four to 5' of free space is required at the sides of trays nearest tenant machine storage. The dimensions required for the opposite side may be reduced to 2'6" or 3'.

3. Washing Machines

Of the 32 PHA-aided projects studied, practically all have distributor owned, coin-operated machines in all or the majority of laundries in each project. One-third of these projects have both distributor-owned

and tenant-owned in the same laundry. There are no projects with project-owned machines.

a. Number of distributor-owned machines required. In the majority of existing projects, 4 distributor-owned machines are provided per 100 families. In a few 5 are provided.

Of the 180 families interviewed who use coin-operated machines, nearly 80 percent report they must wait for machines due to an insufficient number or due to machines out-of-order. Twenty percent of this number report they must wait due to an insufficient number only, and the remainder report waiting due both to maintenance and number inadequacy. At present, scheduling in many laundries must be based on the number of machines provided, not on the number needed.

The number of washing machines per number of users is dependent upon the following: The number of hours the laundry is open weekly, the number of periods families require weekly, the operating time of the machine, and time losses in operation.

The majority of laundries are open from 48 to 72 hours weekly, the latter period of operation is the more satisfactory. As previously stated, the average number of periods for all families approximates 1 2/3 per family or 169 periods per 100 families, and the average number of machine loads required by all families weekly is 5. The actual operating time of coin machines is usually 30 minutes. The actual time loss per 30-minute run, for non-automatic machines due to wringing and rinsing of clothing and miscellaneous losses is 30 minutes. The time loss for automatic machines is about 20 minutes per run. These findings show that 1 non-automatic machine is required for each 14 families and 1 automatic machine for each 17 families.

Based on the above with a 72 hour weekly laundry operating period, the following number of machines are required for each 100 families using the laundry:

Laundries equipped with automatic machines only,	6 machines
" " " " " and with 12 percent of tenants owning machines,	5 "
" " " non-automatic machines, only,	7 "
" " " non-automatic machines and with 12 percent of tenants owning machines	6 "

Large laundries equipped with automatic machines with complete supervision provided by the distributor, service a much larger number of families per machine, since time loss is reduced to a minimum. Families sort clothes at home, time schedules are precisely kept and no time is used in hanging clothes in driers. In the one laundry studied, 1 machine serviced 40 families in an 80 hour week, equivalent to 1 machine for 36 families in a 72 hour week (see page 14). Distributor provided supervisors are not feasible in small laundries such as are provided in the majority of FHA projects.

Some managers recommended 1 additional automatic machine in large laundries due to the frequency of repair needs to automatics. The distributors contacted agreed to this proposal. It is doubtful that distributors would provide an additional machine in laundries with but 2 or 3 machines.

b. Costs to tenants for washing in coin-operated machines. The rate paid by tenants per half-hour washing period is 10 cents in most projects. The average cost of washing per week for all tenants using all types of coin-operated machines is 45 cents. There is expected variation in cost with family size but unexpected variation in the use of types of machines.

The average cost of weekly wash for all families using all types of machines based on numbers in family is as follows:

Number in family	2	3	4	5	6	over 6
Cost per weekly wash	.35	.40	.40	.50	.70	.60

It should be noted that large families, those with more than 6 members, spent less for weekly wash than 6-member families. This was because these particular families were located in projects where they were unable to obtain the number of periods they required.

Based on the present existing machines in the projects studied, tenants weekly washing costs also vary with machine types.

Number in family	2	3	4	5	6	over 6
Cost per weekly wash for:						
Automatic machines	.40	.45	.45	.60	.90	.75
Non-automatic	.30	.35	.35	.45	.40	.50

Based on the findings, the additional cost to tenants using automatic machines is due to the inability to over-load these machines without their becoming out-of-order. It is due also to the need for careful sorting for those machines equipped to rinse and partially dry clothes. Tenants, however, receive more service from the automatic than the non-automatic.

c. Proceeds to projects. The amount projects receive from distributors for the use of space and utilities for coin-operated machines varies. The majority receive 10 percent of the intake. The receipts for this percent range from $1.25 to $4.00 per month per machine. In the latter instances, laundries were open 7 days weekly and 24 hours daily and tenants used individual drying lines.

Several projects receive a flat rate of $4.00 per month per machine; 1 receives $4.50; some receive $2.00 for 1 machine and $3.00 for 2 machines. Two projects receive as much as 21 percent of the gross income and 3 receive none of the income. In one project receiving a flat rate of $2.00 per machine per month, the Tenant Council which contracts for the machine receives $2.00, pays $1.00 to the project for utilities, and deposits the other $1.00 in the Tenant Council fund.

With project intake from machines as low as $1.25 per month based on a 10 percent payment to projects, distributors receive $135 per year. With the deduction of maintenance costs, which are not high, since housing managers in 2 projects report that not more than 2 maintenance calls per month for adjustments are made, machines can be amortized in 1 or 2 years or even less. However, adequate maintenance in many projects is not obtained.

d. Machine maintenance and other tenant dissatisfactions. The quality of maintenance depends largely upon the local distributor. About one-third of the managers or maintenance engineers, and the majority of tenants reported inadequate maintenance. There were far more complaints on inadequate maintenance on the automatic machine than on the other type, except in a few projects where non-automatics had worn out and were about to be replaced. Wringers on a number of wringer-equipped machines were entirely inadequate. Machine wringing was little better than hand wringing. However, at the time of the study, new rollers were reported difficult to obtain. It would be assumed that since distributors receive income only when machines are in running order that maintenance would be satisfacoty, but adequate maintenance was not obtained in the majority of projects. Also, machines may require considerable adjustment and continue to operate and tenants continue to use them.

Eighty-seven percent of the tenants intereviewed who used automatics only in PHA-aided projects were dissatisfied. The 3 outstanding tenant dissatisfactions reported were: "machine out-of-order", "machines do not wash clean" and "washings cost too much". More than half of these dissatisfied tenants objected to inadequate maintenance.

Machines out-of-order. According to a number of distributors of automatics, tenants over-load machines; 1 or 2 state tenants attempt to wash too heavy materials. A number of managers believe the

automatic is too complicated for tenant operation without supervision. In 1 project, the distributor reported 7 of 8 motors had burned out during a period of 9 months.

Machines not washing clean. The cycle for washing is set at 30 minutes but a 40 and 45 minute period is required for the complete process. Reducing the cycle to 30 minutes, usually means the elimination of the soaking period. In 1 or 2 projects, the cycle has been increased to 35 minutes. Many tenants have a tendency to over-load machines which often causes breakage and usually results in not washing clean. A large number of tenants report the necessity of soaking clothes or pre-washing before using machines.

High cost of washing. The cost of weekly washing for all tenants interviewed was reported considerably higher for the automatic by tenants who had used both types of machines (see page 10). Although the cost of the run for each type of machine is usually 10 cents, the automatic costs tenants 28 percent more for weekly washing than the non-automatic machine. This has been reported due to the fact that the overloading of a non-automatic does not produce as unsatisfactory results as an automatic, and tenants wash more clothes for the 10 cent operation. It is due also to the need for more careful sorting for the automatic resulting in the need for more operations. Although the automatic appears to result in higher weekly washing cost, it also performs the functions of rinsing and partially drying which saves the labor of rinsing and wringing.

e. Machine drainage. Many distributor-owned machines of all types neither drain directly through floor drains or into laundry trays, but drain on floors. This results in very unfavorable washing conditions. Also, the drains in many laundries are not adequate to carry off the water sufficiently fast and the residue of scapy water is reported by some managers to result in slippery floors.

f. Project-owned machines. In 9 of the 32 aided projects studied, managers or local authorities strongly recommend project-owned machines. A number of others want to investigate. Nearly all recommendations were based on improved maintenance and lower operating costs to tenants. Based on income from machines (see page 11) adequate maintenance costs could be met and the amortization cost period should not exceed 2 years. If costs to tenants were reduced, amortization periods obviously would be longer. The average life of all machines has not been determined, but some are still operating which have been in use over 5 years, and in 1 project machines have been in operation for a period of 8 years.

g. Accidents. Few accidents have been reported caused by machines. However, all machines should be grounded, including tenant-owned, when in use.

h. Machine use in special type laundries. One State-aided project was included in the study to determine the practicability of a supervised laundryette, equipped with coin-operated automatic machines requiring no laundry tray use. Space and utilities are furnished by the project. The laundry services approximately 800 families. It is equipped with 20 coin-operated machines 1 for each 40 families; 1 pair of trays, 1 extractor, four 6' benches for tenants use during waiting periods or during operating periods of machines, and 2 supervisors' tables. Operating hours are from 8 a.m. to 10 p.m. for 5 days and 8 a.m. to 6 p.m. on Saturdays. Two supervisors - 1 day and 1 night - paid by the distributor, schedule tenants, supervise use of machines, weigh clothes when necessary, lock and unlock and sweep laundries. Tenants report to the laundry mornings or evenings to arrange for a period the same day with the supervisor. If no machines are available the tenant must return another day. If the tenant is late, she loses her period. Each tenant is allowed 1½ hours daily but she is permitted as many days as she wishes. Tenants must bring laundry sorted. There is no time loss with this arrangement. Machines are operating almost constantly.

Tenants like the washing arrangement because they are able to wash as frequently as they desire and because there is no waiting for machines. The frequency of tenants' washing is from 1 to 6 times weekly. The average weekly cost of wash based on the number of tenants reporting is 65 cents.

Tenants must carry wet wash back to units to dry since drying rooms are inadequate. The 1 extractor which operates 20 minutes for 10 cents, does not completely dry all clothes during the operation and based on the tenants interviewed, only about half use the extractor due to added cost to washing. Adequate driers appear to be necessary.

The project receives $4.50 per month per machine. Distributors collect from machines daily and machines are supposed to be repaired daily, if necessary. However, one-fourth of the machines were out-of-order at the time of the survey and one-third of the tenants interviewed reported maintenance inadequate.

The local housing authority in the city in which this project is located, contemplates using this type of laundry for other projects. According to the authority, there is expected to be few machines owned by tenants in this area.

This laundry arrangement is worthy of further study for large multiple dwelling projects. It does not appear feasible where few machines are required since full-time supervision is necessary for its success.

4. Clothes Driers

Inside drying is practically a year-around essential in the northwest section of the country where climatic conditions permit little outside drying; it is essential in localities where soot and dirt prevent outside drying, and for those multiple-dwelling projects or portions of projects where layout does not permit outside drying yards.

The greatest problem encountered in laundry operation is that of drier inefficiency. Tenants in a large number of projects reported they must carry half-dry clothes back to units. Some reported they must dry entirely in units where a number of driers are out-of-order. This is difficult for tenants and affects household operation, but even more important it increases unit condensation and utility cost.

In nearly 1/3 of the laundries studied where forced circulation driers had been installed, drying time varied from 12 to 24 hours. Some driers are but a slight improvement over a normally heated room. Considerable expenditure has been necessary in some projects to improve driers; others are still unimproved. To accomplish the most efficient use of laundry space and equipment, drying time should approximate machine washing time. Inefficient driers are a bottleneck in scheduling and non-conformity to scheduling creates greater tenant friction than any other laundry problem.

a. Types. Two types of driers are in use in the 22 projects studied with driers. In 18 projects the forced circulation or blower type is used and in 4, mechanical driers. Other projects were in localities where no inside drying is required.

(1) Forced circulation driers. There are no forced circulation driers considered entirely satisfactory. Drying time required is too long for the efficient use of the laundry equipment which must be used with driers and long periods required for drying resulted in insufficient drying equipment. A number of tenants also reported they were unable to wait long periods for their clothes. They needed them. Many driers were out-of-order and this reduced the amount of usable equipment.

To specify problems of existing forced circulation driers would result in case histories. Noted below are problems that are typical. No recommendations are made for improved layout, or size and capacity of equipment; since based on project experiences, and a number of maintenance superintendents' reports, it is doubtful that these driers can be economically improved to meet requirements.

Examples of Problems.

(a) Drying compartments are so located that 2 blower type heaters, located near the ceiling were expected to dry 600' of wet clothes, some of which are a distance of 40' from the heaters. Exhaust fans are located in laundry rooms, not in drying compartments, and at a distance of more than 50' from some clothes lines. The air withdrawn by these fans must pass through a 4' wide corridor from drying compartments. Fan and motor capacity were reported adequate. Drying time for most compartments approximated 6 hours. In those compartments where heaters are located it is slightly less. Little improvement was experienced in laundries with heaters placed at a lower level.

(b) No provision for drying was originally installed other than the heat of the laundry room. A blower type of unit heater was later installed in the laundry room to provide more heat, and an exhaust fan in the drying room. These rooms are separated by 2 intermediary rooms. Cabinet driers are being investigated. Drying time is 12-24 hours.

(c) One heater and 1 exhaust fan were so installed that heat circulated through the entire laundry including the 4 drying compartments with from 300-400 feet of line. Drying time approximated 12 hours.

(d) Laundries where circulating fans only were installed with the heat in the laundry expected to dry clothes, resulted in a 24 hour drying period; and laundries which have heaters and no exhaust fans.

(e) In 1 or 2 projects, 1 heater and 1 exhaust fan were installed in the drying compartment area for 4 compartments. This arrangement was improved by directing the hot air through ducts to each drying compartment. This considerably reduced the 10 or 12 hours drying time formerly required.

In a number of projects effort has been made to improve driers but definite improvement costs could not be determined.

Drying time was either too long or some driers were out-of-order in all projects studied with blower-type driers. The following time was reported for the laundries with forced circulation driers:

hours	percent of laundries
more than 24 hours	3
12 to 24 hours	31
6 to 12 hours	25
4 to 6 hours	38
2 to 4 hours	3

The majority of tenants using laundries where drying time is 2 to 4 hours, reported driers were out-of-order or did not dry in this period at all times.

Both inadequacy and insufficiency of drying equipment were revealed by tenant interviews. Of all tenants reporting on blower-type driers, 70 percent state they must wait for drying equipment, due to insufficiency of amount. This is partially due to long drying periods required. A large percent of these and the majority of the other 30 percent reported waiting due both to inadequate equipment and driers out-of-order. Tenants also report a considerable difference in the heat in the various drying compartments resulting in difficulties in scheduling due to preferences for the best compartments.

The inadequacy of drying equipment, requiring families to dry in units, increasing unit condensation, could be met by providing driers that adequately operate in less than an hour rather than in a number of hours.

A number of managers and maintenance superintendents report costs of correction for adequate performance to be too expensive an undertaking. They recommend mechanical driers. Local Housing Authority maintenance superintendents who supervise projects with both types strongly recommend mechanical driers.

(2) Mechanical driers. Only 4 projects studied were equipped with mechanical driers. These were cabinet type, gas operated. Although their time performance varies, due to the quality of driers installed, they are far superior to the forced air circulation type. A few were purchased that require more maintenance than desirable. The drying time for the most efficient of these driers was from 20 to 40 minutes - 20 minutes for light clothing and 40 minutes for heavy.

In the two projects with the most effective mechanical driers, where clothes dried in 20 to 40 minutes, driers were of two makes. The maintenance on the better type was reported by the maintenance superintendent to be practically negligible, less than $1.00 per drier per year. The maintenance on the other was high due to flimsy cabinet material and construction. The operation of these driers requires 8,400 cu.ft. of gas per year per tenant, for those tenants using driers practically the entire year. Gas rate in this locality is 4½ cents per 100, resulting in a cost of $3.75 per tenant per year. The present cost of the better drier is $225 f.o.b. factory with approximately 62' of line capacity. Most families use 2 driers per period.

Mechanical driers are recommended, particularly for all projects with unimproved blower-type driers, particularly with drying time of 4 hours or more resulting in inadequate drying equipment. They are recommended for new projects where group laundries must be built.

In a number of commercial developments where laundry facilities are located in the basement of the building occupied by tenants, spinner type domestic driers are in use, with one domestic drier for each coin-operated machine. These are reported very satisfactory as to operating time and maintenance.

b. Line for inside drying

(1). Amount required and amount provided. According to tenant reports, the average feet of line required per tenant wash is 127 feet for families of all sizes.

Based on the amount of line and periods required, or 1 2/3 periods per family, the following lineal feet are necessary for each family using driers for laundries open a 12-hour day and 6-day week:

required drying period	ft. required per tenant
40 min.	4.5
2 hours	8.8
10 hours	35.0

Driers cannot be operated continuously. There is drier operating time loss for each tenant using it for hanging and removing clothes and unavoidable delays. 1/ Full-time supervision is necessary if these delays are to be prevented.

1/ It should be noted in computing amounts of line, that the ft. required per tenant cannot be obtained for a 4-hour drying period, by doubling that of a 2-hour period, since there is approximately a 45 minute operating time loss for each tenant using the drier.

Obviously, the longer the drying period the greater the amount of line required. The existing insufficiency in amount of drying line created in part by long drying periods required, has made scheduling of drying practically impossible. The average line length per tenant based on the number of weekly drying periods reported required by tenants for a 10-hour drying period for some of the projects was but 9', about one-fourth of the amount necessary. Long drying periods of 8, 10 or 12 hours require large amounts of drying line and consequently a large amount of space to permit the amount of drying line required by tenants.

(2) Line height and spacing. Line height in a number of projects is as much as 6'8" and 7'. Both heights were reported to be too high for the tenants using the compartments, and some tenants were required to use chairs. A height of 6' or 6'2" is recommended.

Line spacing for drying compartments with blower-type driers ranged from 9" to 15". Too close spacing obviously retards drying time. Spacing of 12" is recommended if blower-type driers are used. Spacing can obviously be less in mechanical cabinet type driers and 4" or 5" is reported adequate.

(3) Hooks and types of lines. Hooks in walls are preferable to pipe for attaching lines. The latter with no fixed line spacing results in uneven line spacing which affects drying time. Wire lines were supplied by projects in about half the laundries with compartment drying. The remainder were rope lines supplied by tenants. The latter is unsatisfactory. Lines are cut and stolen resulting in difficulties between tenants. Wire project-supplied lines are recommended.

c. Drying compartment locks. In 15 of the 18 projects with laundries equipped with drying compartments, tenants are required to supply locks and keys to permit the locking of compartments when in use. A number of projects request tenants to attach their names and addresses to locks but this is not always a requirement. The major problem with locked compartments is that of tenant failure to remove clothing and locks at the end of their clothes drying periods.

In all of the 15 projects, tenants are reported to leave clothes in locked compartments longer than the time permitted. Much of this occurs when drying requires longer periods to dry than permitted, and tenants must remove half-dry clothes. Some managers report this over-period use by tenants to be a major problem, since management is required to locate tenants or break locks and remove clothes. In a few projects a charge of 50 cents is collected for

this service. Decreasing the drying time of the drier and permitting realistic drying periods will decrease most of the difficulty, according to tenant reports on inadequate drying periods. Furthermore, where there are short drying periods, such as those that can be obtained by adequate mechanical driers, tenants remain in the laundry until drying is completed and no locks are required, For those negligent tenants or those who repeatedly fail to meet their requirements, penalties should be fixed and enforced.

Thievery in a few projects was reported due to compartments with inadequate partial partitions. It can largely be eliminated by extending front partitions and doors nearly to the floor and side partitions within a few inches of ceilings.

5. Ironing Boards and Hot Plates

In the majority of laundries, ironing boards had originally been provided, but in about half they have been removed. In only 1 project where they still exist, are they in use and here in summer only, since the laundry is cooler than the units. All ironing boards, not in use, should be removed from existing laundries. In the majority, they are badly soiled and where space is otherwise needed, this area can serve a purpose. They should not be provided in new laundries.

Hot plates exist in half the laundries studied. A few tenants use them. In a few laundries they have been removed and in a few others, all or a portion will be removed. In those projects where none exist, tenants are satisfied to make starch in units. A few accidents have occurred from hot plates. Tenants are also reported to use them for heating laundries. Based on the maintenance of these and their unsightly condition in many laundries, removal is recommended. Difficulties in keeping laundries and equipment clean indicate that no more than essential equipment should be provided. Hot plates are not recommended for future laundries.

6. Sorting Tables and Benches

Sorting tables exist in but 8 of the 32 laundries studied in aided projects. The majority of tables are portable and practically all are too small. In only 2 projects were they in use. About half of the tenants report sorting on laundry floors; nearly half at home and the remaining few, in laundry trays or on existing ironing boards. Laundry floors are undesirable for sorting. They are frequently dirty and frequently wet. Newspapers used by tenants add to project maintenance since tenant maintenance at present is entirely unsatisfactory. Many tenants would like sorting tables but more need space for supplies near their operating space. But few laundries have places for tenants to sit during machine-operating periods and a number of tenants requested such facilities.

Sorting tables or their equivalents are not requirements. Tenants can be instructed to sort clothes in units. If tables are desired, benches approximating 5'2" long, 15" wide and 15" high, placed adjacent to the sides of each 2 pairs of trays with tray fronts adjacent, will serve the three needs - sorting and a place for supplies near the place where the tenant operates, and a place to sit while waiting for machines operations or clothes drying. The length or approximately 5'2" is equivalent to the depth of the 2 trays with the 1'2" shelf between; each bench will serve 2 operators. For those laundries equipped with automatic machines only, benches between machines, if machines are placed adjacent to walls, will serve the purpose.

7. Toilet Facilities

More than half of the laundries studied were originally equipped with toilet facilities, but a large portion of them have since been removed or boarded up. All but 2 of the managers or maintenance superintendents reporting on toilets, refer to difficulties in maintenance. Drains become clogged, paper is strewn on floors and a number were found too unsanitary for use. Children and adults not using laundries are reported using these facilities. The majority of managers do not recommend them; 7 reported they were needed; others did not comment. Although some families must walk a considerable distance to laundries, unless toilets can be kept in a decent and sanitary condition, they should be either boarded up or removed from existing projects. If toilets are used chiefly by outsiders they are not needed in laundries. If laundry users require them, tenants should be responsible for cleanliness.

With decreased time periods for future laundry facilities, particularly drying periods, the use for these facilities should also decrease. Toilets are not recommended for future laundries.

8. Storage for Tenant-Owned Machines

Tenant-owned machines were stored in 14 of the 32 laundries intensively studied in aided projects. In the total 14 laundries, about 12 percent of the families using laundries had tenant-owned machines. The provision of storage for these machines is a local determination, since in a number of localities where group laundries are provided, the tenants using the laundries had none.

In the majority of the laundries either rails for locking machines are provided or machines are stored in the laundry area with no locking provision. In a few laundries, machines are stored in vehicle and meter rooms, and most of these areas are entirely inadequate due to too many machines for room areas, resulting in machine inaccessibility for some tenants. Damage to machines is also reported by removing or returning them to rooms.

Storage in laundry rooms, either with or without rails is unsatisfactory. It results in the necessity of tenants carrying removable parts to and from units to prevent loss. Damage to machines also is reported by tenants. All tenants interviewed on machine storage in laundry rooms were dissatisfied. A washing machine is a precious possession to a tenant requiring a long period of saving for its purchase. About one-third of the managers of projects where tenant machines are stored in laundries recommend locked storage rooms.

It is not probable that the number of tenant-owned machines will increase requiring laundry storage space. Locked storage rooms, located adjacent to the laundry operating room, permitting a maximum of not more than 8 machines each, is the most desirable arrangement; since 8 tenants only would possess keys and assume responsibility. The area for such a room based on present machine sizes and providing easy accessibility to each machine, would approximate 120 sq.ft. Large rooms accommodating 20 or more machines are less costly but not so desirable.

Consideration should be given in the planning stage of group laundries to tenant-owned machine storage. However, since it will be impossible to determine at this stage the number of tenants, if any, that will own machines, it is advisable to provide space that can be used for other purposes if tenant machine storage is not required.

9. Children's Play Space

Families using existing laundries, return home during the laundry period to look after children; take them to the laundry; leave them with neighbors or wash in the evening and leave children with husbands. One of the reasons reported the most frequently by the tenants who prefer units to central laundries, is the problem of leaving children. Many tenants bring children to laundries, even though in a number of projects it is forbidden by management. The results are unsatisfactory. Some children are destructive, some have had accidents and children create more laundry pick-up, the responsibility for which cannot always be fixed on individual tenants.

Laundry play space is not recommended. It would require full-time supervision and the space, particularly if supervised, would encourage non-users of laundries to bring children, which would further add to management problems. Only 2 managers recommend play space.

Increased unit laundry facilities for future projects and increased efficiency of laundry equipment, both in existing and future projects, which will decrease the length of laundry periods, will improve this condition.

10. Coat Closets

No closets existed; neither did hooks for tenant coats. Tenant out-of-door garments are found on existing ironing boards, hot plates and on other unused equipment.

Coat closets are not recommended, but a hanging strip with hooks is a requirement for both present and future laundries. The number of hooks will obviously depend upon the number of tenants using the laundry for each period.

11. Group Drying Yards

Twenty-one of the 32 aided projects were supplied with group drying yards. In some of these projects where outside drying is practicable a portion of the year, both inside and outside drying is provided. The usual practice is to provide a drying yard for each laundry and adjacent to it which minimizes the distance for carrying wet clothes. However, some families with unit laundry trays and who own their own machines, but have no unit clothes lines, greatly prefer to wash in their own units. For these families the distance, in many instances, required to carry wet clothes is considerable. A few projects have supplied additional group drying yards for such families.

In the remaining 11 projects where no group drying yards were provided, yards were intentionally omitted since outside drying was impracticable because of climatic or other conditions preventing outside drying or they were omitted because inside drying was believed to be adequate. Group drying yards are not considered essential if inside drying is adequate; however, they are recommended in climates and areas where they are usable, even though inside drying is also required. Tenants prefer outside to inside drying and group drying yards reduce the operating cost of laundry driers.

a. Drying lines. The major inadequacy reported by tenants was insufficient line. Distance was not a major problem since the number of tenants who wash in units and must carry wet clothes a considerable distance to drying yards were comparatively few.

(1) Amount of line provided. Two-thirds of the total number of families interviewed who use group drying yards, report they must wait for lines and about 30 percent report insufficient lines available for each wash. Both of which show line inadequacy.

In only 3 of the projects were drying yards scheduled. The majority of tenants reporting inadequacy of line in these projects were permitted to use 120' of line or less per wash. In the 18 unscheduled projects, more than 64 percent of the tenants reported waiting. With drying immediately following washing in the central laundry, scheduling appears unnecessary, but inadequacy of line which does not permit sufficient line per wash results in tenant delay. A few tenants use lines longer than necessary, but inadequacy of line existed, based on tenant needs, in the majority of drying yards studied.

(2) Amount of line required per tenant. Based on reports from all tenants using drying yards, an average of 153' of line is required by each tenant per wash. A few are satisfied with less, some want more. This average is not based on tenant estimate, but on the actual number of lines reported required by tenants for each wash. Since the span of lines between posts was obtained, the required feet could be readily computed. Feet of line per wash does not represent the entire requirement, since many families report the need for washing more than once per week.

Based on the feet of line required per wash and the number of periods families need, 21 feet of line per family is required for each family using drying yards who require a half-day drying period. Obviously, the amount of drying line to be supplied is dependent upon the length of drying period; for those projects where required drying time is less, amounts of line can be less.

(3) Distance between lines and line height. Line spacing is dependent upon the provision of aisles between groups of drying lines. Existing line spacing ranged from 9" to more than 18". Where 3' width aisles are included in the layout, line spacing can be reduced to 12", providing climatic conditions are such that drying can usually be accomplished in a half-day or less. Where no aisles are provided an 18" spacing is required. Drying yards both with and without aisles are satisfactory, providing lines are adequately spaced. Where yards are scheduled the provision of aisles is more satisfactory, since it simplifies the allocation of lines to tenants.

A line height of 6' or 6'2" is adequate.

(4) Distance between posts. The span of lines between posts depends upon yard layout. A span of 35' or less is satisfactory for wire lines.

(5) Types of lines. In the majority of projects, cotton lines are supplied by tenants, and in 2 projects, cotton is supplied by projects. Cotton line is unsatisfactory. Its period of durability is short; tenants report lines are both cut and stolen; and, due to inability to keep lines tight, its appearance is extremely undesirable.

Non-rust wire lines provided by projects are the most satisfactory. Stranded wire lines are not recommended - individual wires break and tear clothing. Turnbuckles to tighten lines are recommended.

(6) Line supports. Both metal and wood posts with arms, and pipe set in concrete are used for line supports. Both metal posts and pipe are satisfactory. Horizontal arms of 3' lengths permit a line spacing of 12" for 4 lines.

b. Ground surfacing. There were no major problems reported on ground surfacing. Both concrete and asphalt are reported entirely satisfactory by management. Of the 7 projects where bituminous was used, in only one was need for replacement reported. The engineer of one local authority stated a preference for asphalt to paving blocks which had been provided. Adequate grading to permit proper drainage was also reported needed by some managers.

c. Enclosures. In two-thirds of the projects, drying yards were enclosed or partially enclosed with wire mesh or chain link fencing, either with or without planting for screening. In 5 projects, 2' - 5' hedges are used and in 2, wood fences. In some projects, hedges and fencing enclose but 2 or 3 sides of the yard. Where all sides of the area are enclosed, in only 3 of the projects were gates provided, and in 1 they had been removed due to breakage by children. Heights of all enclosures varied from 2' to 8'.

A 4' or 5' wire mesh or chain link fence, without gate, enclosing 4 sides of the drying yard is recommended. Some planting for screening is very desirable since it adds greatly to appearance and protects clothes from dust, where yards must be located in areas where dust is unavoidable. Too heavy planting retards drying periods.

E. OPERATION AND MAINTENANCE

1. Hours of Operation

The days and hours of laundry availability vary greatly. In 7 of the 35 projects, laundries are available for use all hours and all days. In 3 of these, laundries are locked and unlocked by tenant keys. In the other 4 projects where laundries are never locked, no serious difficulties are reported of vandalism, the use of laundry facilities by outsiders or the use of the building as a "hang-out". This 24 hour, 7 day arrangement permits the use of the laundry evenings and Sundays by working women and others who require it. The feasibility of the 24-hour daily and 7-day weekly period for laundries never locked is dependent chiefly upon the type of the project's surrounding neighborhood.

The majority of projects open laundries 5½ or 6 days weekly and from 8 to 12 hours daily. In 24 projects, laundries are not open evenings. In these, 30 percent of the tenants report a need for evening use; and in the 22 projects where laundries are not open Sundays, 16

percent report a need for Sunday use. The need for laundry facilities during evenings or Sundays was due to: (a) employment of women during the day; and (b) inability to leave children until husbands return from work. It is the custom in several projects to make special arrangements for laundry use in cases of emergencies, such as providing an evening or a Sunday for families with communicable diseases or special emergency cases. In 1 project, laundries are open 1 evening per week for families unable to wash daytimes.

The opening of laundries evenings or Sundays, or both, is a project determination since projects vary; but it is recommended that this need be determined from tenants, and if required, evening or Sunday use be permitted only to the extent needed.

2. Responsibility for Locking and Unlocking Laundries

Various methods are used in the 35 projects for locking and unlocking and the provision of keys. In 4 projects, laundries are kept unlocked all hours and all days; in 12, tenants have their own keys and lock and unlock laundries; and in 19, management assumes this responsibility. Where laundries are never locked, managers stated there are no major management problems. Major problems appear to vary with project and with surrounding neighborhood. There is considerable vandalism and thievery in many projects, but in some it is reported entirely due to surrounding neighborhoods.

In projects where tenants assume responsibility for locking and unlocking the unit key either is used for the laundry or a separate key provided. Some managers recommend separate keys due to "teenagers" acquiring possession of unit keys and using laundries as "hang-outs". An additional lock is used in a few projects to prevent tenants from entering after closing hours. This arrangement requires project responsibility for unlocking and locking laundries. In the majority of the 12 projects, where tenants use their own keys, managers reported the necessity of checking tenant locking nightly.

In large projects with several laundries each, considerable service can be saved where tenants instead of management assume locking and unlocking responsibility, but savings are reduced where management must check nightly for locking. Tenants should be required to assume full responsibility, necessitating only occasional spot checking by management. If a tenant can assume the responsibility for locking her own unit she can be required to assume the responsibility for locking other project property.

In about half the projects policing was reported necessary during operating hours because of breakage by children, thievery and the use of the facilities by non-project families. Tenants can be required to assume more responsibility in assisting management by reporting these difficulties. The laundry study revealed in most

projects, a much greater number of laundry problems reported by tenants than by management, indicating that many tenants do not feel free to report to management. There appears to be a reluctance on the part of tenants to report to management. In a few projects, tenant reporting is strongly urged by management.

3. Project and Tenant Maintenance

In all projects both management and tenants assume maintenance responsibilities, but in the great majority, management must finally be responsible for some work delegated to tenants.

a. Maintenance by management. In most projects, management hoses the laundry weekly, in a few, more frequently and in a few, only when needed; and sweeps or picks-up, or both, daily. Other janitorial services include cleaning of drains, locking and unlocking where required, some minor repair work and miscellaneous functions. There is considerable variation between projects in the amount of janitorial service used. This is due to variations in maintenance, the amount and quality of tenant maintenance and the distance between laundries. Adequate information on the time spent monthly for janitorial service and for locking and unlocking was not obtainable, but the information does show a higher quality of tenant maintenance where few families use the laundry.

In the extremely low janitorial time required in one project, .7 hours monthly, there were but 13 persons using the laundry, a high quality of tenant maintenance is reported, and management checks but occasionally on tenant locking.

In 21 of the total number of projects, cleaning was reported as contributing to high maintenance cost due to the fact that tenants do not assume their full share of responsibility. Other maintenace functions due to tenant failure to assume responsibility were removing tenant locks from drying compartments, checking on locked doors and windows, picking up after tenants, and turning off laundry driers.

b. Maintenance by tenants. In all projects with the exception of one State-aided, tenants are responsible for leaving washing machines and trays clean after using and for picking up after use. In some projects they are responsible for locking and unlocking and in some for the unlocking of drying compartments after use.

As previously stated, in the majority of projects, these responsibilities are not satisfactorily met. The responsibilities delegated to tenants are simple and not time consuming, and if tenants continuously fail to meet these minor responsibilities, more serious measures than the posting of notices should be used. One or two projects lock laundries permitting no tenants to use them

if tenants fail to meet responsibilities; although this procedure penalizes all tenants, it has been successful in accomplishing results. These laundries were cleaner and in better order than the great majority of laundries studied.

In 1 or 2 projects, tenants organize "tenant cleaning bees" which include a general clean-up, even hosing. Where tenants repeatedly refuse to meet their responsibilities, penalizing appears necessary. With maintenance cost continually rising more tenant maintenance is required.

An aid to tenants in laundry upkeep is the provision of an adequate broom and a trash basket in each laundry. If fines or penalizing becomes an essential, such fines and other types of penalizing should be posted in the laundry. Group meetings of laundry users at which tenant responsibilities are discussed have been quite successful. Tenant suggestion boxes have also been successful. Extensive policing in some projects, even during operating periods, with none required in others indicates that tenants can assume some of this responsibility; although it is realized that projects and project neighborhoods vary.

4. Scheduling Laundry Operations

a. Scheduling and the inadequacy of equipment. The success of scheduling laundry operations is dependent upon adequacy of amount and efficiency of laundry equipment. Scheduling cannot operate efficiently if the length of the period permitted each family is inadequate to accomplish washing and drying or if the number of weekly periods families require cannot be permitted. As previously stated, the average periods required per family is 1 2/3 per week. Present scheduling shows few projects are permitting this number. Seventy-one percent of the tenants reported more hours per week were needed than provided. A number of managers state scheduling is one of their most difficult problems, that tenants will not adhere to periods and hours. Based on tenant reports, the difficulty is not entirely due to tenants, since some equipment, particularly drying equipment, is not adequate in most projects to complete the operation in the time permitted. However, tenants also complain of other tenants not adhering to schedule, which also may be due to lack of equipment.

b. Methods of scheduling and no scheduling. A number of methods of scheduling are in use. A few managers believe their methods used are satisfactory, but tenants in most of these same projects report dissatisfaction.

The 3 principal methods of scheduling in use are: (1) scheduling by management where management fixes periods and hours per tenant or per unit and is responsible for supervision; (2) scheduling by

management and tenants where management determines the buildings to be used and usually specifies days of use only, and tenants operate their own scheduling; (3) scheduling by tenants where tenants assume all major responsibilities. Some projects have no scheduling.

(1). Scheduling by management. In 19 projects, management assumes responsibility. Management establishes days and hours for each tenant to use the laundry, notifies tenants of days, hours and laundry building to be used, and usually posts schedules in laundries. Management must also settle tenant disputes. In some projects, vacant periods are permitted for those families who wish to use the laundry more than once weekly, or large families are scheduled before vacant periods. Other arrangements for large families are scheduling but 5 days and leaving Saturday unscheduled for families wanting extra periods or permitting some evening use. Tenants state that scheduling large families before vacant periods is not satisfactory since they need their periods distributed throughout the week due to the need for clothes. The unscheduled Saturday is reported unsatisfactory, particularly where the tenant's period is on Friday. Where management is responsible, tenants are usually permitted to exchange periods without management's concurrence.

In 2 projects, every unit in the project is allocated a period permitting a number of vacant periods. Tenants report this arrangement unsatisfactory since tenants claim specific vacant periods and learn later that they have been taken by other families.

In 10 of these 19 projects, managers reported scheduling satisfactory. However, tenants in each of the 19 projects reported dissatisfaction and in all but 4, the majority of tenants were dissatisfied. In 1 project where the manager reported scheduling working well, 13 of 14 tenants reported scheduling unsatisfactory. Most tenants' complaints are: "too short and not enough periods and tenants do not adhere to schedules". In the 1 project with the fewest tenant complaints, management spot-checks scheduling every few months, and rearranges schedules to meet needs. This has reduced scheduling problems.

(2) Scheduling by management and tenants. In a few projects, management schedules by building and by day, but not hours. Tenants arrange hours among themselves. Managers believe this scheduling satisfactory, but tenants state: some tenants use too many periods, there is quarreling over equipment, and tenants do not know when they can use the laundry. However, there were fewer tenant complaints in this schedule arrangement than scheduling by management.

(3) Scheduling by tenants. A few projects are operating under the tenant chairman arrangements. These building or stair-hall chairmen are suggested by management and elected by tenant organizations or nominated and elected by tenants. Length of periods of holding chairmanships vary. Chairmen usually have full responsibility for scheduling, adjusting schedules and settling tenant disputes. In some instances, they have the responsibility of reporting machines out-of-order. About half of the managers using this method approve. Others feel it is too much responsibility for tenants. There is also difficulty in obtaining tenants who will accept chairmanship offices. A number of tenants state chairmen show preferences. There were many tenant complaints on this arrangement.

(4) No scheduling. In 6 projects, there is no scheduling. In practically all of these projects, managers state no problems exist. One manager believes no scheduling is required where laundries are open 24 hours daily and 7 days weekly. In 3 of these projects, tenants were dissatisfied. The principal complaint was "tenants' quarrel" over equipment. In those projects where there were no complaints, laundries were either open 24 hours daily or 7 days weekly, or both. Where there is sufficient equipment, problems are reduced and by long periods of operation, the amount of equipment becomes more adequate.

c. Evaluation of scheduling. Based on the present findings, no method of scheduling can be recorded as entirely successful due to inadequate equipment, particularly inside drying equipment, resulting in insufficient scheduled periods and inadequate time per period.

There is considerably more difficulty between tenants in large laundries than in small, not only due to equipment but a variety of reasons. Based on observations, large groups of tenants without constant supervision do not work well together. This was also shown in the Livability Study, in which the chief tenant objection to the use of laundries was "tenant quarreling".

In those laundries where equipment was adequate to permit sufficient periods and periods of sufficient length for tenants, there was considerably less tenant dissatisfaction and quarreling over equipment. When laundries can be opened 24 hours daily, permitting greater use of the equipment, a minimum of scheduling and in some projects, no scheduling is necessary.

d. Recommendations for scheduling improvement

(1) Increase the efficiency and amount of equipment to the extent possible to meet realistic tenant needs.

(2) Provide tenants with the required number of periods and sufficient time per period.

(3) Management to assume responsibility for initial scheduling and tenants to assume responsibility for continuation, preferably by a tenant committee for each laundry. Management to meet with committees periodically on difficulties.

(4) Schedules to be posted in laundries and kept current.

(5) Repetitive violation of scheduling to receive some light penalty, if warranted.

(6) Laundry to be kept open at least 12 hours daily and 6 days weekly, if inadequacy of equipment requires it. Laundry to be kept open some evenings and Sundays if required.

(7) Management to discuss laundry problems occasionally with tenants using laundries, and spot check scheduling.

(8) No scheduling where laundries are small or where projects and neighborhoods are such that laundries may remain open 24 hours daily.

F. UNIT VS. GROUP LAUNDRY FACILITIES

About two-thirds of the tenants interviewed in the 32 aided projects want unit laundries in preference to group facilities. The principal reasons expressed for unit facility preferences were: "care of children", "convenience", which means distance to be traveled to laundry buildings, "dislike of central laundry because of tenant quarreling" and "laundry not clean enough". A few tenants would like both facilities - group laundries for large washings and units for small. Of the few tenants who actually preferred group laundries, their chief reasons were: "use of washing machines" and "gets the mess out of the kitchen".

The many management problems with group laundries - operation, scheduling, maintenance and costs of these; and, tenant dissatisfactions with distance, inefficiency of equipment, scheduling and working in groups, definitely indicate that unit laundry facilities should be provided in every unit in every project possible.

G. GENERAL RECOMMENDATIONS

1. Group Laundries for New Projects

a. Group laundry facilities to be reduced to a minimum by providing adequate unit laundry facilities in all areas and types of units where these are practicable, to reduce project operating costs and eliminate management problems associated with group laundry operations.

b. In large apartment-type projects where several hundred persons must be serviced, and where there are practically no tenant-owned machines, further study is recommended of the Ft. Greene, State-financed project of New York City. Adequate mechanical driers for this type of project are recommended to eliminate the need for carrying wet clothes to units for drying.

c. In other projects where group laundries are required, laundries to be sufficient in number to permit not more than 20 or 25 families to a laundry, reducing distance for tenants, increasing tenant maintenance and simplifying its control, and permitting families with children to be nearer units.

d. Laundries preferably to be located in the building in which tenants live or located not more than 150' from the building exit.

e. In planning new laundries, the actual number of families to use the laundries not only to be determined, allowing for approximately 10 percent who use commercial facilities, but the number of periods of use required per week or an average of 1 2/3 periods per family. The latter will affect area and the amount of equipment.

2. Laundry Equipment for New and Existing Laundries

The amounts of laundry equipment stated below are based on 1 2/3 periods of weekly use per family and a weekly laundry operating period of 72 hours.

a. Laundry trays

(1) Each unit in new projects to be equipped with a sink-tray regardless of group laundry provisions.

(2) In group laundries one pair of laundry-trays is required for each laundry equipped with 3 or fewer automatic machines, and 1 pair for each 3 automatic machines for laundries with more than 3 machines, or 1 pair of trays for each 50 families using the laundry; one pair of laundry-trays for each non-automatic machine, or 1 pair for each 14 families, with the same ratio for tenant-owned machines.

b. Washing machines

(1) To be project-owned, coin-operated.

(2) One automatic is required for each 17 families; 1 non-automatic for each 14 families.

c. Driers

(1) For new laundries, to be mechanical, cabinet type with operating time comparable to the machine run or 30 or 40 minutes; or driers equivalent to cabinet type in operating time, cost and maintenance.

(2) Existing blower-type driers requiring more than 3 or 4 hours in operating time should be replaced by the above type.

(3) Sufficient line or hanging space to be provided to permit families adequate line per wash and an adequate number of washing periods, or 4.5' per tenant of clothes hanging space for mechanical type driers operating in a 40 minute period and 8.8' of line for drying compartments operating in a 2-hour period.

(4) Lines for blower type driers to be wire and project supplied. Height to be 6'2" and line spacing not less than 12".

d. Tenant-owned machine storage

Rooms with locks to be provided adjacent to the laundry operating room, with preferably not more than 8 machines per room in new laundries where machine storage is required and in existing laundries where required and where space is available.

e. Other equipment

(1) Ironing boards, hot plates, sorting tables, toilets, children's play space and coat closets to be eliminated in new laundries. Ironing boards and hot plates to be removed from existing laundries.

(2) Hanging strips with hooks for tenants' wraps to be provided in both new and existing laundries.

3. Group Drying Yards

a. Yards are unessential where inside drying is adequate, but desirable in all areas where climatic and local atmospheric conditions permit outside drying a portion of the year, since yards reduce laundry operating costs and meet the desires of tenants.

b. Where included to be located adjacent to laundries.

c. To be enclosed on all 4 sides, except for access opening, by a 4' or 5' height wire mesh or chain link fence and preferably partially screened by planting. Gates to be omitted.

d. Ground surfacing to be concrete, asphalt, or equal with adequate slope to permit proper drainage.

e. Line supports to be either metal standards with metal arms, or pipe, both set in concrete.

f. Adequate line permitted for all families using yards and required periods of use, or 21' per family for a half-day drying period. Line height to be 6'2" and spacing not less than 12" where aisles are provided and not less than 18" with no aisles.

g. Line to be of non-rust wire and project supplied.

4. Operation and Maintenance

a. The days and hours laundries are to be open to be based both on the sufficiency of equipment and tenant needs for specific days and hours. A 12 hour day and 6 day week is desirable unless equipment and tenant needs permit less time. Management to determine the need for evening or Sunday use, or both.

b. Tenant scheduling is preferable for large laundries; scheduling is unnecessary for small laundries with adequate equipment. Scheduling to be both a management and tenant responsibility with management responsible only for the original determination of buildings, days, and hours for each tenant.

c. Scheduling to be based on the number of periods families require as well as the number of families.

d. Management to contact tenants occasionally on the sufficiency of equipment, adequacy of equipment operation, scheduling and other problems.

e. Tenants to assume complete responsibility for locking and unlocking laundries with spot checking by management, and for laundry pick-up, cleaning of trays and machines after use. Tenants to be urged through special techniques established by management to report all violation of laundry regulations.

f. Tenants to be required to exercise fully all responsibilities delegated to them. Penalizing is recommended if responsibilities are continuously unmet.

g. Schedules, laundry regulations and penalties, if required, to be posted in laundries and kept current.