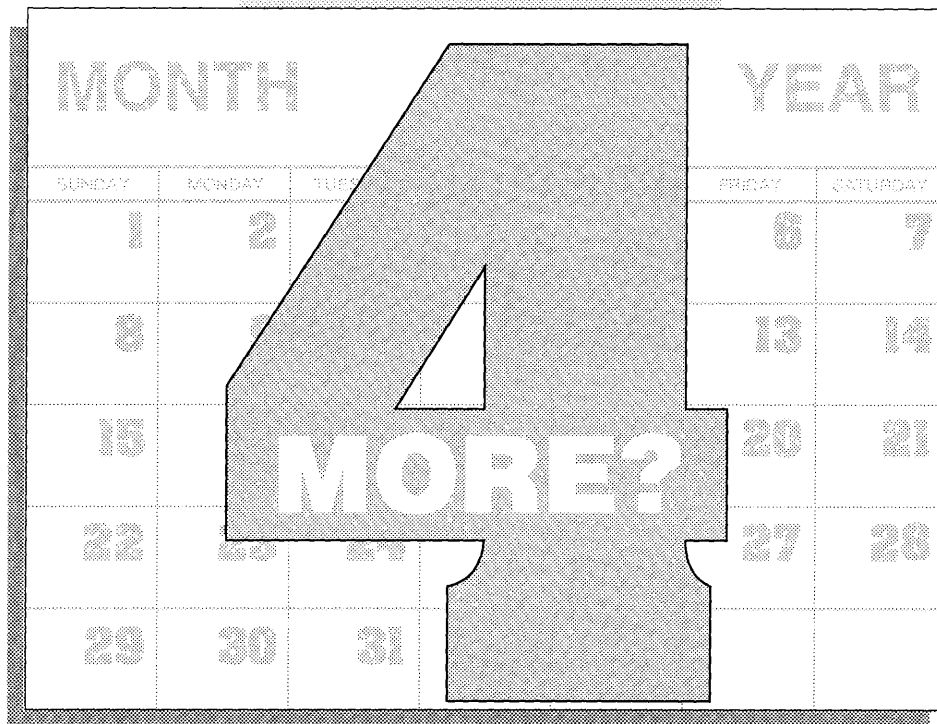


FINAL REPORT

MORE IN FOUR?

AN EVALUATION OF THE FOUR-DAY WORK WEEK IN A VDOT RESIDENCY



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Abstract <p>This report describes the evaluation of an experimental 4-day, 10-hour-per-day work week used by the Virginia Department of Transportation's (VDOT) Chatham Residency between May 15, 1995, and October 6, 1995. The residency, totaling over 100 people, adopted a Monday through Thursday work week during that period. The study evaluated the effect of the modified work week on customer service, work productivity, and employee morale in the area served by the residency.</p> <p>At the inception of the study, the perception was that the 4-day work week would improve customer service, maintenance productivity, and individual and overall employee morale. However, neither work productivity nor customer service to the public was much affected under the conditions set during this study. Concerning employee morale and service to other VDOT staff, results showed that the modified work hours were more likely to cause a negative than a positive overall effect. Thus, the use of a 4-day work week on a residency wide basis primarily affects employee morale and should be used only when there is a high probability that its effect will be positive.</p>				

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(The opinions, findings, and conclusions expressed in this report
are those of the author and not necessarily
those of the sponsoring agencies.)

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ABSTRACT

This report describes the evaluation of an experimental 4-day, 10-hour-per-day work week used by the Virginia Department of Transportation's (VDOT) Chatham Residency between May 15, 1995, and October 6, 1995. The residency, totaling over 100 people, adopted a Monday through Thursday work week during that period. The study evaluated the effect of the modified work week on customer service, work productivity, and employee morale in the area served by the residency.

At the inception of the study, the perception was that the 4-day work week would improve customer service, maintenance productivity, and individual and overall employee morale. However, neither work productivity nor customer service to the public was much affected under the conditions set during this study. Concerning employee morale and service to other VDOT staff, results showed that the modified work hours were more likely to cause a negative than a positive overall effect. Thus, the use of a 4-day work week on a residency wide basis primarily affects employee morale and should be used only when there is a high probability that its effect will be positive.

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INTRODUCTION

The 5-day, 8-hour-per-day work week has been the predominate, almost standard, work week in the Virginia Department of Transportation (VDOT) since at least the early 1960s. In recent years, the Virginia Department of Personnel and Training adopted a policy¹ to allow agencies to modify employee work periods at the employee's or agency's request. The 4-day, 10-hour-per-day work week has been a popular option.

The use of the 4-day work week is usually viewed as an employee benefit, but it can be used to improve efficiency and enhance services. Its use by VDOT is commonplace for individuals and small units, but it is untried for larger units, such as a residency, since the overall effect of such a change is uncertain.

A proposal was made by the resident engineer in the Chatham Residency to test a 4-day work week to evaluate if services could be enhanced and work efficiency and morale improved.² The proposal was made on behalf of a majority of the residency employees. They perceived the 4-day work week to have advantages and disadvantages when compared with the standard 5-day work week:

Potential Advantages:

1. Increased productive time by reducing the travel trips and setup/take down operations from 10 times per week to 8 times per week in maintenance operations where travel is involved.
2. Improved morale among some employees by allowing them to adjust their work schedule to match their personal needs.
3. Improved customer service by extending residency office hours to 7 P.M. on the days they are open.

Potential Disadvantages:

1. No scheduled service available on Friday and the public's perception of this situation.

2. Local government reaction to lack of Friday availability.
3. Decreased morale among some employees by requiring them to adjust their work schedules without their approval.
4. Difficulty responding to emergencies on Fridays.
5. Difficulty coordinating schedules with other units that work the 5-day work week (i.e., district crews and Department of Corrections inmate crews).

The proposal was to modify the work schedule of the Chatham Residency as follows:

1. The residency would work traditional hours from October to May. The entire residency would be on a revised time schedule from the first full week of May to the first full week of October.
2. The maintenance areas, specialty crews, and shop work hours would change to four 10-hour days running Monday through Thursday. Hours would be from 7:00 A.M. to 5:30 P.M.
3. The residency office staff work hours would change to four 10-hour days running Monday through Thursday. The office would be open 12 hours those four days, from 7 A.M. to 7 P.M. Individual staff members' hours would be adjusted to cover the full 12-hour period.
4. The inspectors' work schedule would adjust to the project work schedule, just as it does now, but would default to the residency office work schedule when a project was not active.

The proposal was approved by VDOT's Assistant Commissioner for Operations for testing during May through September 1995. The Virginia Transportation Research Council (VTRC) was directed to monitor and evaluate the experiment.

The Chatham Residency was chosen for the experiment for two reasons. First, the management at the area headquarters, residency, and district levels was supportive of the idea. Second, the Danville-Pittsylvania area was perceived to be well suited to take advantage of the positive features of the plan. The percentage of people in the Danville area employed in jobs with rigid work schedules is higher than the statewide average. As such, they find it more difficult to visit the residency office for services during the 8 A.M. to 5 P.M. time period. Extended hours, Monday through Thursday, had the potential to be a real benefit to the citizens covered by the residency.

PURPOSE AND SCOPE

The purpose of this study was twofold: (1) monitor the implementation of the modified work week in the Chatham Residency, and (2) evaluate its effect on customer service, work productivity, and employee morale in the area served by the residency. This study investigated only the perceived advantages and disadvantages listed previously.

METHODS

The monitoring and evaluation of the 4-day work week was divided into three areas: customer service, work productivity, and employee morale.

Customer Service

The residency exists to perform a number of services and functions, but basically, these are performed for two sets of customers: those outside VDOT (the public) and those inside VDOT (other VDOT staff). The public includes citizens at large, the elected officials representing the residency area, county government staff, and other state agencies with which the residency works closely. Other VDOT staff include, primarily, staff of the Lynchburg District Office.

Activity Prior to Implementation

As preparation for the initiation of the 4-day work week, the public was informed of the plan. The elected officials of the area were contacted, and the plan was discussed with them in detail. This contact took the following form:

- The Pittsylvania Board of Supervisors were contacted by a letter to the board in March 1995 and discussions were held with them at an open meeting in April 1995.
- The members of the General Assembly, six delegates and one state senator, were contacted individually, in person, by the resident engineer and informed of the plan. This occurred during April 1995.
- The county government was formally informed of the plan by letter to the county administrator and through personal contact between the resident engineer and the administrator.

- Other agencies were informed by letter. In the case of the Department of Corrections' local convict camp, the local state police unit, and the Pittsylvania County Sheriff's Department, personal contacts to explain the plan were also made.
- Other VDOT staff were contacted verbally through the section managers. They were informed of the proposal and requested to express concerns that would be considered in the development of the 4-day work week plan.
- To inform the public, a press release was sent to the daily newspaper and radio stations that primarily serve the Pittsylvania County-City of Danville area. The release was targeted for the 2-week period before the start of the experiment. Announcements were also posted at the entrance to the residency office beginning in the 2-week period before the start of the experiment.

Activity During the Experimental Period

To improve the public's access to the residency on Fridays and in cases of emergency, three steps were taken:

1. A portable cellular phone was assigned to the resident engineer, the assistant resident engineer, and the maintenance operations manager on a rotating basis. The telephone number was made known to residency personnel and selected district staff. Those assigned the telephone were responsible for monitoring calls during the 8:15 A.M. to 5:00 P.M. period on Fridays.
2. An answering machine was installed for the residency office telephone. Calls were recorded during periods the office was not open.
3. A kiosk was installed outside the front door of the residency office. Signs were placed facing the visitors' parking lot indicating the revised hours of the office and directing visitors to the kiosk for basic information.

To measure the effect of the 4-day work week on service to the customer, the following actions were taken:

1. The members of the board of supervisors and the local representatives of the General Assembly were contacted by letter in July and requested to complete a questionnaire. The questionnaire (see Appendix A) requested that they describe the effect of the 4-day work week directly on them and any responses they had received from their constituents.

2. The county administrator, sheriff, local state police unit leader, and correctional unit leader were contacted by letter in July and requested to complete a questionnaire. The questionnaire (see Appendix A) requested that they describe the effect of the 4-day work week directly on them and their area of responsibility.
3. Questionnaires (see Appendix A) were placed in the kiosk at the residency office door. Those seeking services at the residency during periods the residency was closed were encouraged to complete one.
4. Callers leaving messages on the answering machine during periods the residency office was closed were contacted by telephone. They were questioned concerning the effect of the office closing.

Activity After the Experimental Period

The members of the board of supervisors and the local representatives of the General Assembly were contacted by letter in October and requested to complete a questionnaire (see Appendix B). The questionnaire requested that they describe the effect of the 4-day work week on them and any responses they had received from their constituents.

The county administrator, sheriff, local state police unit leader, and correctional unit leader were contacted by letter in October and requested to complete a questionnaire (see Appendix B). The questionnaire requested that they describe the effect of the 4-day work week on them and their area of responsibility.

The Lynchburg District Office staff were also sent a questionnaire (see Appendix B) directed to the district section managers.

Work Productivity

Systems to measure productivity in the residency primarily measure ordinary maintenance activity. For this reason, only the ordinary maintenance activities were monitored in this study. VDOT's Maintenance Management System (MMS) was the source of data. This system measures productivity as manhours/unit accomplished by dividing the labor hours expended for the activity in a given time period by the units of work accomplished over the same period. Units of work are expressed as a quantity of materials used or an area or a distance maintained for a specific activity. The system measures only quantity, not quality. The MMS has received criticism as being susceptible to manipulation since the productivity of some maintenance activities are not measured. The recording of data is not strictly controlled, and work is sometimes charged to these unmeasured activities when productivity is anticipated to be low. Also, there is criticism that the data are error filled because quantities of work accomplished are

often estimated and inaccurate. The MMS, however, currently produces the best information available on ordinary maintenance productivity. The method chosen to evaluate productivity was to compare productivity data for the study period with that for the same monthly periods in 1993 and 1994.

The Chatham Residency is a single county residency having only a primary and a secondary road system. The MMS produces two reports, by system, at both the residency and area headquarters levels for ordinary maintenance activities. The residency level reports were chosen for review for two reasons. First, the experimental work week is a residency wide program and its impact should be viewed on a residency wide basis. Second, the short duration of the study, 5 months, and the relatively small size of the individual units made area headquarters' quantities for individual activities small. In the MMS, small quantities of any activity are subject to greater influence by an unusual event.

The MMS divides ordinary maintenance into 107 activities. Some, such as tunnel activities, are not applicable to the Chatham Residency, but more than 80 do apply. Of these activities, a small number cover the bulk of the expenditures of cost and personnel. A review of the cost expenditures for ordinary maintenance between May 1, 1995, and September 30, 1995, indicated that the majority of the money expended during the period was for administration (Activities 101-109, 299) and 7 regular activities, each, for both the primary and secondary systems. Since no other individual activities represented more than 3 percent of the total ordinary maintenance expenditure for the system during the period, these were the only activities reviewed. Table 1 indicates the activities and information concerning expenditures.

Once the activities to be monitored were chosen, information was reviewed for each chosen activity in the MMS reports for each system for the months May through September for the years 1993 through 1995. The information reviewed was the manhours worked at each activity, the quantity of work accomplished when measured, and the labor rate. The labor rate for the experimental period was compared to that for the May to September period in 1993 and 1994.

Employee Morale

Although this experiment was requested on behalf of the employees of the Chatham Residency, only 60 percent of them indicated they were in favor of the revised work hours when polled before the start of the experiment. Of the other 40 percent, 26 percent were against the idea. The remaining 14 percent were neutral, had no opinion, or suggested other work hours. The results of the initial survey are shown in Table 5.

To monitor the effect of the modified work hours on employee morale, two surveys were conducted after the completion of the experiment. The first (see Appendix C) was similar to the initial survey and was sent to each residency employee. The second involved interviews with approximately 25 percent of the residency's employees. The employees were assigned to one of

Table 1

**Ordinary Maintenance Expenditures
May through September 1995**

Account No.	Description	Expenditure (\$)	% of Total
Primary System			
Administration		95,492.00	35.8
171	Tractor Mowing	30,034.00	
159	Other Drainage Care	26,503.00	
173	Brush Cutting	19,256.00	
117	Heavy Mechanized Paving	18,155.00	
181	Signs	16,291.00	
163	Dead Animal Patrol	11,771.00	
142	Repair Non-Hard Surface Shoulders	<u>6,598.00</u>	
	Seven Maintenance Activities	128,608.00	48.2
	Subtotal (Admin. + 7 Activities)	224,100.00	84.0
	Subtotal (Remaining Activities)	24,415.00	16.0
	Total Expenditure	266,515.00	100.0
Secondary System			
Administration		228,660.00	18.3
159	Other Drainage Care	168,917.00	
171	Tractor Mowing	160,802.00	
161	Erosion Repair	119,308.00	
173	Brush Cutting	110,822.00	
117	Heavy Mechanized Patching	75,614.00	
132	Machining Non-Hard Surface Roads	68,607.00	
111	Spot Sealing/Skin Patching	<u>64,857.00</u>	
	Seven Maintenance Activities	768,927.00	61.5
	Subtotal (Admin. + 7 Activities)	998,631.00	79.8
	Subtotal (Remaining Activities)	251,195.00	20.2
	Total Expenditure	1,249,808.00	100.0

five groups: maintenance, inspection, residency office staff, shop, and supervision. Approximately 25 percent of the employees in each group were chosen, by a random draw, for interview by the author. The purpose of the interviews was to supplement the results of the full survey with additional detail concerning the employees' attitudes, likes, and dislikes with regard to the experimental work hours. The interview form can be found in Appendix C.

RESULTS

Customer Service

Contacts by the general public with the residency office on Fridays were through a questionnaire available in the kiosk at the front door of the residency and through voice mail or an answering machine on the residency telephone. During the experimental period, 3 questionnaires and 55 telephone messages were received. None of the questionnaires indicated that the lack of Friday service had inconvenienced the respondent. Concerning the 55 telephone messages, 40 were received over two weekends, one of which involved major storm damage in the area.

The board of supervisors and the state legislators representing Pittsylvania County were surveyed in July, during the experiment, and in October, after the experiment was completed. This involved 14 people in July and 13 people in October. Nine responses were received from the July request, and 8 from the October request.

Responses to the July survey indicated that none of the elected officials had received any comments from their constituents on the experimental work week. Two had personally used the residency's services during the extended hours, but none had needed residency services on Friday. The October survey mirrored the July response. None of the eight had received any comments from their constituents. Two had used the services of the residency after normal hours, and none had been inconvenienced by the Friday closing. Five of the eight expressed support for the concept based on their experience with it, and none opposed its continuation.

The sheriff, the local state police sergeant, the local convict camp captain, and the Pittsylvania County Administrator were sent surveys in July and November. No response was received from the county administrator either time, but the other three responded both times. On both occasions, all three indicated they had no problems that arose from the 4-day work week. The convict camp captain indicated the revised schedule meshed better with the camp's schedule and needs, since some of their guards also work a 4-day week. The sheriff and the camp captain both indicated support for the 4-day work week. Although no specific problems arose during the experimental period, the state police sergeant seemed to be more comfortable having VDOT personnel readily available 5 days a week. He suggested the residency designate a person to work the normal hours each week to be available in case the state police needed immediate assistance.

Surveys were sent to 18 section managers in the Lynchburg District Office. Responses were received from 12. Most indicated they were not affected, either adversely or beneficially, by the 4-day work week at the Chatham residency. There were two exceptions:

1. The district materials engineer indicated that lack of availability of administrative personnel on Fridays was a "big problem" (the survey's word choice, not the

respondent's) on construction matters. He indicated that "Construction matters requiring immediate attention were delayed for four days." Immediate attention in this case means that some investigation or action needed to be started on the matter to avoid delay of other items, not that the matter was an emergency.

2. The district equipment superintendent submitted responses from six of his staff who deal with the residencies. All six used the survey form for their response. Five indicated that the residency being closed on Friday caused them some small problems. Most of these revolved around communicating information and scheduling deliveries and training. The buildings and grounds supervisor indicated the 4-day work week caused his group big problems when it came to scheduling preventive maintenance and repairs to residency buildings. All six responses recommended uniform work hours on a district wide basis for more efficient operation.

Work Productivity

The MMS measures productivity on many of the individual activities chosen for evaluation. Although none of the administrative activities has productivity measures, 9 of the 14 regular activities are measured. The productivity measurements of these activities were reviewed in detail. A review of the monthly figures (May to September) for 1995 indicated that data on the quantity accomplished (measured in metric tons of plant mix used) on activity 117 (heavy mechanized patching) on the primary system were in error. Since the labor rate (manhours/metric ton) is dependent on the total quantity accomplished, this activity was dropped from the analysis. The 1995 monthly and study period labor rates for the remaining 8 measured activities were compared to the labor rates for the same activities over the same periods in 1993 and 1994. The comparison was on both a monthly basis and the average for the full 5-month period in each year.

The MMS data were reviewed for the 8 activities investigated during the May to September period in 1993, 1994, and 1995. The significant data for comparison between each year's figures were the manhours per unit of work accomplished. This average labor rate for each activity for the 5-month study period in each year is shown in Table 2. The comparison of the monthly labor rate for each activity in each year reviewed is shown in graphic form in Appendix D.

To more easily compare the data for manhours per unit worked for each activity over the three years compared, Figure 1 was developed. The manhours worked per unit were divided by the data for 1995 for each activity. This makes the 1995 data "1" and the 1994 and 1993 data a fraction of the 1995 data.

A review of the graphs in Appendix D indicated that the labor rate for most activities varied widely from month to month. Also, in most cases, there was no single year's activity that

Table 2

**Average Labor Rate for Selected Activities
May to September, 1993 to 1995**

Activity No./Sys.	Description	Work Units	Manhours per Unit		
			1993	1994	1995
142P	Repair non-hard surface shoulders	Metric tons	0.50	1.06	0.65
171P	Tractor mowing	Hectares	3.73	4.15	3.39
173P	Brush cutting	Hectares	105.36	---	86.93
111S	Skin patching	Metric tons	1.21	1.01	1.09
117S	Heavy mechanized patching	Metric tons	0.98	1.80	1.43
132S	Machine non-hard surface roads	Kilometers	0.90	0.81	0.95
171S	Tractor mowing	Hectares	3.63	3.73	3.04
173S	Brush cutting	Hectares	70.89	231.35	149.49

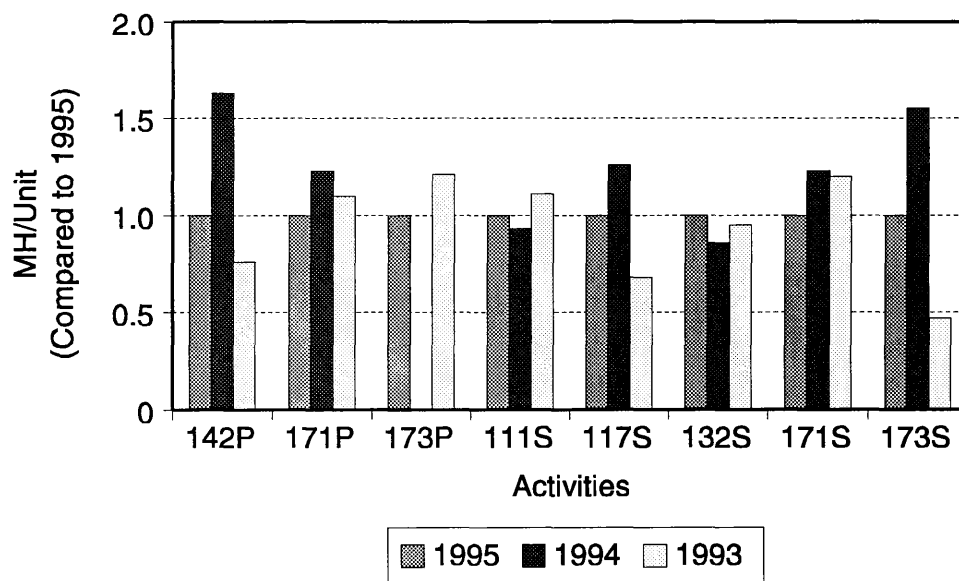


Figure 1. Comparative Labor Rates for Chatham Residency (May to September)

was consistently better or worse than in the other 2 years studied when compared on a month-to-month basis. Many reasons could account for this. Among them are the following:

- The small quantities of work involved on a monthly basis are greatly influenced by unusual circumstances (e.g., weather, equipment breakdowns).
- Errors in reporting the accomplishment information since many of the quantities are estimates.
- The change in the level of skill and personnel available over the three periods studied. The Work Force Transition Act of 1995 resulted in the loss of 11 maintenance employees, many of whom were the more highly skilled at maintenance.

A review of Figure 1 indicated that only primary mowing (171P), primary brush cutting (173P), and secondary mowing (171S) had a better labor rate than in the previous 2 years. For the other five activities, the work in one or both of the previous 2 years was accomplished at a lower labor rate.

Employee Morale

To monitor the effect of the modified work hours on employee morale, two surveys were taken after the completion of the experiment. The first survey was sent to every employee in the residency and was similar to the survey of employees taken prior to the start of the experiment. The second survey was an interview of approximately 25 percent of the residency employees.

The tabulation of results of the before and after surveys of all employees is shown in Table 3. Since maintenance and shop employees accomplish most of their work in small teams, thus making it impractical for them to work individually unique hours, the results of the survey for that group are also listed.

Table 3 indicates that 121 people responded to the before survey and only 94 responded to the after survey. This was due to the emphasis placed on the before survey and a reduction in MEL between surveys. As a part of the before survey, the resident engineer visited with each work group and discussed the proposal. Employees were urged to express their opinion through the survey form, and work unit supervisors actively pursued the completion of the form. The after survey was distributed to each employee, but unit supervisors did not actively collect the survey forms. In addition, the number of employees in the residency was reduced from 121 to 108 between surveys.

Comparison of the percentage for and against the plan in the two surveys indicated a 20 percent decrease in support, with most of the change going to the "Other" column. Most of the change in support occurred within the maintenance force, where 13 people originally supportive expressed opposition after the experiment ended. People in the "Other" column included those who were neutral on the plan, were not sure of their position on the plan, or wanted to modify the plan. In the after survey, 18 of the 26 people in the "Other" category suggested a modified plan.

Table 3**Before and After Survey of Employee Preference**

Location	For Plan		Against Plan		Other	
	Before	After	Before	After	Before	After
Gretna AHQ	3	5	8	4	4	3
Camp 15 AHQ	10	0	5	2	0	9
Brosville AHQ	6	2	6	8	1	1
Mt. Airy AHQ	11	4	2	6	1	2
Kentuck AHQ	6	6	9	7	1	4
Rondo AHQ	8	8	4	2	2	0
Shop & Signs	<u>8</u>	<u>4</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>4</u>
AHQ Subtotal	52	29	34	29	9	23
Office	10	6	1	1	0	1
Inspectors	<u>11</u>	<u>2</u>	<u>1</u>	<u>1</u>	<u>3</u>	<u>2</u>
Total	73	37	36	31	12	26
Maintenance (%)	55	36	36	36	9	28
Total (%)	60	40	30	36	10	24

The comments of the employees on the survey forms gave a further indication of their attitude toward the 4-day work week. The major categories of comments were as follows:

Personal Convenience:

- Forty-one felt they had more time for doing things such as scheduling appointments and being with their family.
- Thirty-three felt they had less time for their family and personal business Monday through Thursday, and it was not feasible to make up for this loss on Friday.

Efficiency:

- Eleven felt that more was accomplished with the 4-day work week since travel to and from the job site was reduced to 4 times per week.

- Only 1 directly stated that he or she felt productivity was reduced, but 23 cited heat and fatigue as problems. These are conditions that usually affect efficiency.

Safety:

- Two felt that being off on Friday removed them from the road on the highest traffic day each week.
- Two cited concern over heavier traffic on the road after 3:30 P.M. This was in addition to the 23 who cited heat and fatigue, which could also lead to less safe conditions.

Morale:

- Only 1 comment indicated directly that morale had improved, although the 41 comments indicating more time was available for personal things could be interpreted as morale building.
- Three problems concerning paychecks and leave time were mentioned on a number of submissions. The tone of the comments indicated they negatively affected morale. These problems were:
 - Permission could not be obtained to distribute paychecks on Thursday evening in those cases where payday fell on Friday. Twenty-five people cited having to go to their office to pick up paychecks when payday fell on Friday as a negative factor.
 - Two hours of annual leave was charged each employee when holidays fell on Monday through Thursday. Thirteen people cited this as a negative factor.
 - Ten hours of leave time was charged to any employee who took all day leave. Eleven people cited this as a negative factor.

To gather more detailed information regarding the concerns of the employees, interviews were held with 25 percent of the employees. To reduce bias from the interviews, the employee base was divided into five groups based on type of work assignment. Twenty-five percent of each group was then randomly chosen for interview. When the interviews were held, making contact with two employees proved difficult and they were eventually dropped from the interview list to allow the analysis of the interviews to proceed on schedule. The groups, their population, the number initially chosen for interview and the number eventually interviewed were as follows:

Group	Number	Chosen	Interviewed
Maintenance	80	20	19
Construction Inspection	11	3	2
Residency Office Staff	5	1	1
Shop	4	1	1
Supervision	8	2	2
Total	108	27	25

Of the 25 interviewed, 6 had less than 5 years' service, 13 had 6 to 20 years' service, and 6 had more than 20 years' service. Based on the interviews, the support of the group before and after the experiment was as follows:

Time of Survey	Support	Oppose	No Opinion	Mixed	Total
Before	11	7	7	0	25
After	14	7	1	3	25

The increase in support over the life of the experiment among the interview group ran counter to the view expressed in the survey of the residency as a whole (a 27 percent increase versus a 20 percent decrease).

Four of the people interviewed rode to work with someone. Although two were for and two were against the 4-day work week, the need to coordinate travel did not seem to be a major consideration in their deliberations.

Seven of the people interviewed indicated they had to adjust their personal schedules to accommodate the revised hours of the 4-day work week. Six of the seven had to modify arrangements for the care or supervision of their children. One employee indicated that the 4-day work week, with its longer hours Monday through Thursday, required the employee to give up his or her second job. A review of their opinions about the 4-day work week before the experiment indicated that none considered the need to change his or her personal schedule in forming an opinion. That personal adjustments had little effect on their opinion is supported by the fact that the opinion among these 7 people changed from 2 for, 4 against, and 1 no opinion before the experiment to 4 for and 3 against after the experiment.

One purpose of the interviews was to obtain more information and detail about the concerns and benefits employees perceived with the 4-day work week. No new concerns or benefits were raised that had not been indicated on the general survey form, but certain items were reinforced:

Benefits:

- Eight liked the long weekends.

- Eleven perceived that employees were more productive and more tasks were completed in 1 day.

Concerns:

- Eleven felt fatigue affected the work output.
- Eight were concerned that when paydays fell on Friday, they could not be paid on Thursday evening.
- Eight did not like having to give up two additional hours of annual leave for holidays or when they took a day of vacation.

DISCUSSION

Customer Service

The findings of this study indicated that the revised work hours had very little effect on the public the Chatham Residency serves. The increased service anticipated as a result of the extended hours did not occur. The extended hours did not result in a large increase in visits to the residency office. The perceived public benefits of this plan did not occur.

The internal customers of the residency, primarily the Lynchburg District Office, had mixed opinions. Most were not affected, either positively or negatively, by the revised hours. Those in the materials section involved with active construction projects or in the equipment section did appear to be negatively affected. These problems can be attributed directly to the difference in work hours between the residency and the district staff. The absence of residency management personnel to deal with construction project problems on Saturdays is normal and an accepted statewide practice. The lack of conveniently available management personnel on a normal work day is not. Since construction projects will continue to operate 6 days a week, some accommodation is necessary. The concerns of the equipment section were primarily ones of convenience. All six responses from equipment personnel stated that there should be uniformity between the hours of the various work units. Although this may reflect a lack of understanding of the purpose of this experiment, it also indicates the importance of informing those affected by such a plan and the difficulty of gaining acceptance of such a plan. Based on the comments of the district staff, there was no perceived improvement in customer service to other VDOT staff and there may have been a negative influence on employee morale at locations outside the residency.

Work Productivity

The MMS data indicated wide variation in the productivity rates of most maintenance activities when viewed residency wide on a monthly basis. There was no consistent improvement or decrease in productivity in the 1995 performance data indicated by the data reviewed. On the basis of wide variation and no consistent trend in the data, no objective conclusion concerning productivity can be made.

Employee Morale

A major benefit of the revised work week was anticipated to be an improvement in morale among residency employees. Although a majority of the employees did support the 4-day work week, the percentage supporting the idea decreased over the life of the study. Many of those opposed had a very strong dislike for the concept.

CONCLUSIONS

At the inception of this study, it was perceived that the 4-day work week would improve customer service, maintenance productivity, and individual and overall employee morale. The findings indicate the following:

- Customer service to the public was unaffected by the 4-day work week in this specific circumstance. No significant increase in service occurred, but the overall public perception was positive, or passive at worst.
- Perception of the 4-day week by other VDOT employees is that it is an employee benefit. At best, their attitude is passive on its value. The tendency by others is to view it negatively, especially when it causes them problems, perceived or otherwise.
- Improvements in productivity of maintenance operations through working four 10-hour days are mixed. Subjective judgment indicates that productivity on certain equipment-oriented activities may improve, but those involving physical labor seem to be less efficient. The wide variation of the productivity data, combined with their possible inaccuracy, further erodes their value. Overall, the effect of the 4-day work week on productivity is inconclusive.
- Although morale is improved in individual cases, this is offset by reduced morale among those “forced” to revise their hours to comply with the wishes of the majority.

The conclusion is that neither work productivity nor customer service to the public is much affected by the implementation of a 4-day work week under the conditions set and experienced during this study. Although other experiences may occur in other settings, the conditions imposed upon the residency as a part of the 4-day work week appear capable of responding adequately to those experiences.

Concerning employee morale and service to other VDOT staff, the conclusion is that changes that affect employees as a result of the 4-day work week are more likely to cause a negative than a positive overall effect. Employees not working the 4-day work week schedule who are in contact with those who do are likely to be negatively affected if affected at all. The morale of employees required to work a 4-day schedule who do not wish to will be reduced. Without a very high level of employee support, or passive acceptance, of the concept by those affected by the change, the negative impact on the morale of the work force will probably outweigh improved morale.

The overall conclusion is that the use of a 4-day work week on a residency wide basis primarily affects employee morale and should, therefore, be used only when there is a high probability that its affect will be positive.

RECOMMENDATION

Based on the findings and conclusions of this study, it is recommended that the 4-day work week be an option for use on a residency wide basis provided the following conditions are met:

- The elected officials and state and local government officials having a local interest support the concept and this support is verified in writing.
- A large majority of the employees of the residency are supportive of the hours set. Although no minimum percentage could be accurately determined from this study, it should include a majority of employees working at each geographical location.
- Convenient contact with residency management when the residency office is closed during the normal 5-day business week is arranged. A standby system as used in this experiment or a similar system is recommended. A telephone system to record incoming telephone calls when the office is closed is also recommended.
- If residency operations, such as construction and construction management, continue to operate on a schedule different from the 4-day work week, management personnel are available to respond to problems that arise during the normal 5-day work week.

- Options to deal with the disincentives of a payday falling on an off day and annual leave being charged for part of a holiday are resolved before approval of the 4-day work week at a specific location. Options available should be explained to employees involved and their acknowledgment confirmed.

REFERENCES

1. Virginia Department of Personnel and Training. 1993. *Policy 1.25: Hours of Work*. Richmond.
2. Wiles, T. A., and Roosevelt, D. S. April 1995. *More in Four: An Experiment with the Four Day Work Week in the Chatham Residency*. Charlottesville: Virginia Transportation Research Council.

APPENDIX A

SURVEY OF ELECTED OFFICIALS, JULY 1995

SURVEY OF LOCAL GOVERNMENT OFFICIALS, JULY 1995

CITIZEN QUESTIONNAIRE AT RESIDENCY OFFICE KIOSK

QUESTIONNAIRE, TELEPHONE CONTACT

ELECTED OFFICIALS SURVEY: FOUR DAY WORK WEEK
CHATHAM RESIDENCY

As you are aware, the Chatham Residency of the Virginia Department of Transportation (VDOT) has been using a revised schedule of four 10 hour work days, Monday through Thursday, since May 15, 1995. All offices in the residency have been closed on Friday since that date. We request your assistance in evaluating this experiment. Your answers to the following questions would be appreciated.

1a. Since May 15 of this year, have you needed VDOT services on Friday when the Residency office was closed? ____ Yes [PLEASE ANSWER 1b] ____ No [GO TO 3]

1b. If yes, how often? ____ times.

1c. What kind of service was it? [CHECK ALL THAT APPLY]

____ Maintenance problem	____ Construction under way
____ Obtaining a permit	____ Construction planned
____ Maps	____ Information
____ Other (Please specify)_____	

2. How much of a problem was it for you that the office was closed on Friday?
____ Not a problem, ____ Small problem, ____ Big problem, ____ Emergency.

3a. Our old office hours were 8 A.M. to 5 P.M. Our new hours are 7 A.M. to 7 P.M. Since May 15 have you used VDOT services before 8 A.M. or after 5 P.M.?
____ Yes [PLEASE ANSWER 3b] ____ No [GO TO 5]

3b. If yes, how often? ____ times.

3c. What kind of service was it? [PLEASE CHECK ALL THAT APPLY]

____ Maintenance problem	____ Construction underway
____ Obtaining a permit	____ Construction planned
____ Maps	____ Information
____ Other (Please specify)_____	

4. How helpful was it to you that the office was open before 8 A.M. and after 5 P.M.?
____ Very helpful, ____ Somewhat helpful, ____ Did not matter.

5. Have you received any comments from citizen concerning the revised hours
____ Yes ____ No. If yes, please summarize them. (Please use back of form if necessary)

6. Do you have any suggestions for improving our services under this revised work schedule concept?

Name _____

Phone _____

LOCAL GOVERNMENT SURVEY: FOUR DAY WORK WEEK
CHATHAM RESIDENCY

The Chatham Residency of the Virginia Department of Transportation(VDOT) has been using a revised schedule of four 10 hour work days, Monday through Thursday, since May 15, 1995. All residency offices have been closed on Friday since that date. We request your assistance in evaluating this experiment. Your answers to the following questions would be appreciated.

1a. Since May 15 of this year, have you needed VDOT services on any Friday when the office was closed? ☐ Yes [PLEASE ANSWER 1b and 1c] ☐ No [GO TO QUESTION 3].

1b. If yes, how often? _____ times.

1c. What kind of service was it? [PLEASE CHECK ALL THAT APPLY.]

<input type="checkbox"/> Maintenance problem	<input type="checkbox"/> Construction under way
<input type="checkbox"/> Obtaining a permit	<input type="checkbox"/> Construction planned
<input type="checkbox"/> Maps	<input type="checkbox"/> Information
<input type="checkbox"/> Other (Please specify)_____	

2. How much of a problem was it for you that the office was closed on Friday?
☐ No problem, ☐ Small problem, ☐ Big problem, ☐ Emergency.
Please give some details if you desire.

3a. Our old office hours were 8 A.M. to 5 P.M. Our new hours are from 7 A.M. to 7 P.M. Since May 1 have you used VDOT services before 8 A.M. or after 5 P.M.?
☐ Yes [PLEASE ANSWER 3b. and 3c.] ☐ No [GO TO 4].

3b. If yes, how often? _____ times.

3c. What kind of service was it? [PLEASE CHECK ALL THAT APPLY]

<input type="checkbox"/> Maintenance problem	<input type="checkbox"/> Construction under way
<input type="checkbox"/> Obtaining a permit	<input type="checkbox"/> Construction planned
<input type="checkbox"/> Maps	<input type="checkbox"/> Information
<input type="checkbox"/> Other (Please specify)_____	

PLEASE TURN THIS SHEET OVER AND COMPLETE THE INFORMATION ON THE
BACK

4. How helpful was it to you that the office was open before 8 A.M. and after 5 P.M.?

____ Very helpful, ____ Somewhat helpful, ____ Did not matter.

Please give some details if you desire.

5. Do you have any suggestions for improving our services under this revised work schedule concept?

Name _____ Date _____

Phone _____

REQUEST FOR INFORMATION
CHATHAM RESIDENCY

The Chatham Residency of the Virginia Department of Transportation(VDOT) has been using a revised schedule of four 10 hour work days, Monday through Thursday, since May 1, 1995. All residency offices have been closed on Friday since that date. We request your assistance in evaluating this experiment. Your answers to the following questions would be appreciated

1. Please give us the following information:

Day _____ Date _____ Time _____ A.M.
P.M.

2. Why have you come to this office at this time? Please outline your problem in the space below.

3. Do you want someone to call you about this concern on the next normal working day? ____ Yes ____ No

4. Please give us your name and phone number:

Name _____

Phone _____

PLEASE ANSWER THE QUESTIONS ON THE BACK

1. Were you aware that the work schedule had been revised?
☐ Yes[GO TO 2] ☐ No[GO TO 3]

2. How did you learn about the revised work schedule?[CHECK ALL THAT APPLY]
☐ Visit to the office (office open)
☐ Visit to the office (office closed)
☐ Telephone call ☐ Newspaper
☐ Radio ☐ Other (Please specify)_____

- 3b. Since May 1 of this year, have you needed VDOT services on Friday when the Residency office was closed?
☐ Yes[PLEASE ANSWER 3b] ☐ No[GO TO 5]

- 3b. If yes, how often? _____ times.

- 3c. What kind of service was it? [CHECK ALL THAT APPLY]
☐ Maintenance problem ☐ Construction under way
☐ Obtaining a permit ☐ Construction planned
☐ Maps ☐ Information
☐ Other (Please specify)_____

4. How much of a problem was it for you that the office was closed on Friday?
☐ Not a problem, ☐ Small problem, ☐ Big problem, ☐ Emergency.
 Please give us some details if you desire.

- 5a. Our old office hours were 8:15 A.M. to 5 P.M. Our new hours are 7 A.M. to 7 P.M. Since May 1, have you come to the Residency office to obtain VDOT services before 8 A.M. or after 5 P.M.? ☐ Yes[GO TO 5b]
☐ No[GO TO 7]

- 5b. If yes, how often? _____ times.

- 5c. What kind of service was it?[CHECK ALL THAT APPLY]
☐ Maintenance problem ☐ Construction under way
☐ Obtaining a permit ☐ Construction planned
☐ Maps ☐ Information
☐ Other (Please specify)_____

6. How helpful was it to you that the office was open before 8 A.M. or after 5 P.M.? ☐ Very helpful, ☐ Somewhat helpful, ☐ Did not matter. Please give some details if you desire.

7. Do you have any suggestions for improving our services under this revised work schedule concept?

TELEPHONE LOG
NON-WORK HOUR CALLS

Date _____ Time _____

1. Caller's Name _____

Address _____

2. Phone Number _____

3. Caller's Problem _____

This call was logged by _____

Questions 4-8 were answered by _____

4. Was the caller's phone call returned? ____ Yes ____ No.

If yes, when? Date _____ Time _____

If no, why not? _____

5. When did the caller call the office?

Date _____ Day _____ Time _____ A.M. P.M.

6. Was the caller aware of the revised work hours before this call?

____ Yes ____ No

7. What does the caller think about the revised work schedule?

____ Not concerned, ____ inconvenienced, ____ very concerned, ____ unknown

8. Additional information about the call or caller _____

APPENDIX B

SURVEY OF ELECTED OFFICIALS, OCTOBER 1995

SURVEY OF LOCAL GOVERNMENT OFFICIALS, OCTOBER 1995

SURVEY OF LYNCHBURG DISTRICT SECTION MANAGERS, NOVEMBER 1995

ELECTED OFFICIALS SURVEY: FOUR DAY WORK WEEK
CHATHAM RESIDENCY

As you are aware, the Chatham Residency of the Virginia Department of Transportation (VDOT) used a modified work week schedule of four 10 hour work days, Monday through Thursday, between May 15 and October 1, 1995. All offices in the residency were closed on Friday between those dates. We request your assistance in evaluating this experiment. Your answers to the following questions would be appreciated.

1a. Between May 15 and October 1, did you needed VDOT services on Friday when the Residency office was closed? ____ Yes [PLEASE ANSWER 1b] ____ No [GO TO 3]

1b. If yes, approximately how often? ____ times.

1c. What kind of service was it? [CHECK ALL THAT APPLY]

____ Maintenance problem	____ Construction under way
____ Obtaining a permit	____ Construction planned
____ Maps	____ Information
____ Other (Please specify)_____	

2. How much of a problem was it for you that the office was closed on Friday?
____ Not a problem, ____ Small problem, ____ Big problem, ____ Emergency.

3a. Our old office hours were 8 A.M. to 5 P.M. Our new hours were 7 A.M. to 7 P.M. Between May 15 and October 1 did you use VDOT services before 8 A.M. or after 5 P.M.?
____ Yes [PLEASE ANSWER 3b] ____ No [GO TO 5]

3b. If yes, approximately how often? ____ times.

3c. What kind of service was it? [PLEASE CHECK ALL THAT APPLY]

____ Maintenance problem	____ Construction under way
____ Obtaining a permit	____ Construction planned
____ Maps	____ Information
____ Other (Please specify)_____	

4. How helpful was it to you that the office was open before 8 A.M. and after 5 P.M.?
____ Very helpful, ____ Somewhat helpful, ____ Did not matter.

5. Have you received any comments from citizen concerning the revised hours
____ Yes ____ No. If yes, please summarize them. (Please use back of form if necessary.)

6. Do you have any suggestions for improving our services under this revised work schedule concept?

7. How do you feel about continuing this concept in future years?

Support __, Opposed __, No opinion __, Why _____

Name _____

Phone _____

LOCAL GOVERNMENT SURVEY: FOUR DAY WORK WEEK
CHATHAM RESIDENCY

The Chatham Residency of the Virginia Department of Transportation (VDOT) used a revised schedule of four 10 hour work days, Monday through Thursday, from May 15 to October 1, 1995. All residency offices were closed on Friday during that period. We request your assistance in evaluating this experiment. Your answers to the following questions would be appreciated.

1a. Between may 15 and October 1, did you need VDOT services on any Friday when the office was closed? ☐ Yes [PLEASE ANSWER 1b and 1c] ☐ No [GO TO QUESTION 3].

1b. If yes, approximately how often? _____ times.

1c. What kind of service was it? [PLEASE CHECK ALL THAT APPLY.]

<input type="checkbox"/> Maintenance problem	<input type="checkbox"/> Construction under way
<input type="checkbox"/> Obtaining a permit	<input type="checkbox"/> Construction planned
<input type="checkbox"/> Maps	<input type="checkbox"/> Information
<input type="checkbox"/> Other (Please specify)_____	

2. How much of a problem was it for you that the office was closed on Friday?

☐ No problem, ☐ Small problem, ☐ Big problem, ☐ Emergency.

Please give some details if you desire.

3a. Our old office hours were 8 A.M. to 5 P.M. Our new hours were from 7 A.M. to 7 P.M. Between May 15 and October 1, did you use VDOT services before 8 A.M. or after 5 P.M.?

☐ Yes [PLEASE ANSWER 3b. and 3c.] ☐ No [GO TO 4].

3b. If yes, approximately how often? _____ times.

3c. What kind of service was it? [PLEASE CHECK ALL THAT APPLY]

<input type="checkbox"/> Maintenance problem	<input type="checkbox"/> Construction under way
<input type="checkbox"/> Obtaining a permit	<input type="checkbox"/> Construction planned
<input type="checkbox"/> Maps	<input type="checkbox"/> Information
<input type="checkbox"/> Other (Please specify)_____	

PLEASE TURN THIS SHEET OVER AND COMPLETE THE INFORMATION ON THE BACK

4. How helpful was it to you that the office was open before 8 A.M. and after 5 P.M.?

____ Very helpful, ____ Somewhat helpful, ____ Did not matter.

Please give some details if you desire.

5. Do you have any suggestions for improving our services under this revised work schedule concept?

6. How do you feel about continuing this concept in future years?

Support ____, Oppose ____, No opinion ____, Why _____

Name _____ Date _____

Phone _____

DISTRICT SURVEY: FOUR DAY WORK WEEK
CHATHAM RESIDENCY

The Chatham Residency used a revised schedule of four 10 hour work days, Monday through Thursday, between May 15 and October 1, 1995. All residency offices were closed on Friday between those dates. We request your assistance in evaluating this experiment. Your answers to the following questions would be appreciated.

Name _____ Phone _____

1a. Since May 15 of this year, have you needed residency services or personnel on any Friday when the office was closed?

____ Yes[PLEASE ANSWER 1b and 1c] ____ No[GO TO QUESTION 3].

1b. If yes, how often? _____ times.

1c. What kind of service was it? [PLEASE LIST]

2. How much of a problem was it for you that the office was closed on Friday?

____ No problem, ____ Small problem, ____ Big problem, ____ Emergency.

Please give some details.

3a. Our old office hours were 8 A.M. to 5 P.M. Our revised hours were from 7 A.M. to 7 P.M.

Since May 1 have you used residency services before 8 A.M. or after 5 P.M.?

____ Yes[PLEASE ANSWER 3b. and 3c.] ____ No[GO TO 4].

3b. If yes, how often? _____ times.

3c. What kind of service was it? [PLEASE LIST]

4. How helpful was it to you that the office was open before 8 A.M. and after 5 P.M.?

____ Very helpful, ____ Somewhat helpful, ____ Did not matter. Please give some details if you desire.

5. Do you have any suggestions for improving our services under this revised work schedule concept?

APPENDIX C

SURVEY FORM FOR EMPLOYEE MORALE

INTERVIEW FORM FOR EMPLOYEE MORALE

VIRGINIA DEPARTMENT OF TRANSPORTATION: CHATHAM RESIDENCY
FOUR 10-HOUR DAY WORK WEEK

With the end of the four, 10-hour day work week experiment, the Department needs to evaluate the results. One important area to review is the effect and opinion of the employees involved. Please complete the attached survey and return it to Mr. Wiles. Please return by November 17.

Location (Choose one): Supervisory ____, Office staff ____, Shop ____, Inspection ____,
Maintenance (Area name)_____

Prior to the experiment:

- ____ I liked the idea of four day 10-hour work week.
____ I did not like the idea and wished the schedule to stay as it was.
____ I did not like the idea and wished to go to another work schedule.
____ I was not sure about the proposal.
____ I had no opinion on the proposal and would work the schedule determined by my supervisor

Now that the experiment is complete:

- ____ I like the idea of a four day 10-hour work week.
____ I do not like the idea and wish the schedule to stay as a five day 8-hour work week.
____ I do not like the idea and wish to go to another work schedule (Please comment below).
____ I am not sure how I feel.
____ I have no opinion on the experimental hours and will work the schedule that is determined by my supervisor.

What problems did the experimental work week cause you? (Use back if more space needed.)

What benefits did the experimental work week give you? (Use back if more space needed.)

Comments:

FOUR DAY WEEK
EMPLOYEE INTERVIEW

Name _____ Title _____

Location _____ Years with VDOT _____

1. How far do you live from your work? _____ How long is the trip? _____

2. How do you get to work? _____

3. Do you ride with anyone? _____ How often _____ Who? _____

4. Do you have other things that must be adjusted when your work hours are changed? (example: child care, second job)

5. Prior to the experiment, how did you feel about the 4 day work week?

_____ Why? _____

6. Now that the experiment is complete, how do you feel about the four day week experiment? _____ Why? _____

7. What problems did the experimental work week cause you? _____

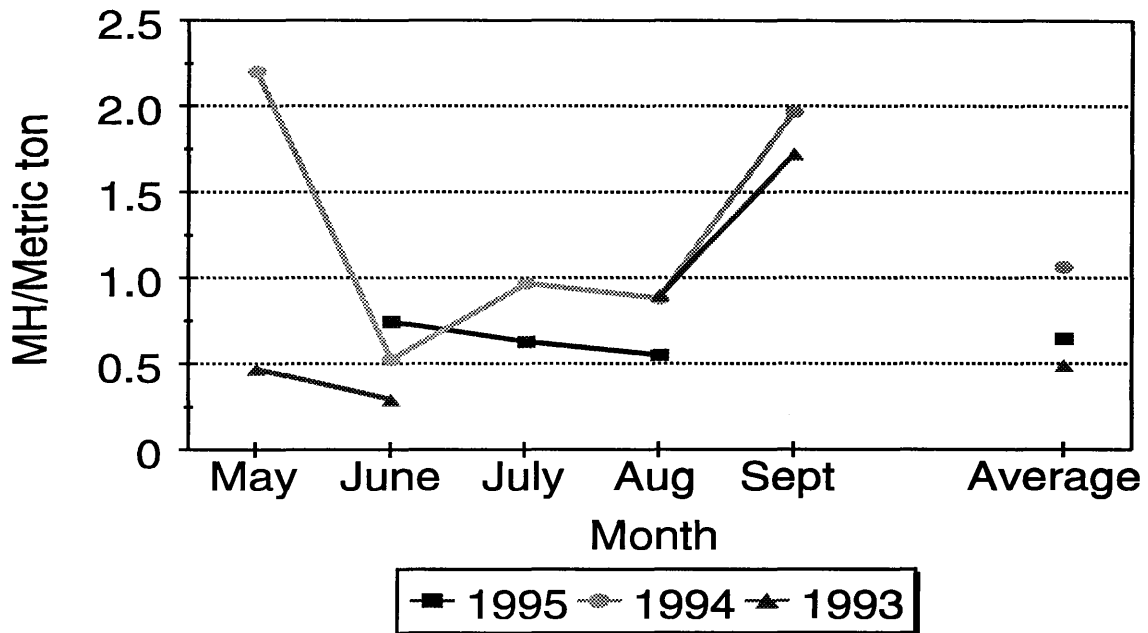
8. What benefits did the experimental work week give you? _____

9. Do you have any suggestions for other work hours or days? _____

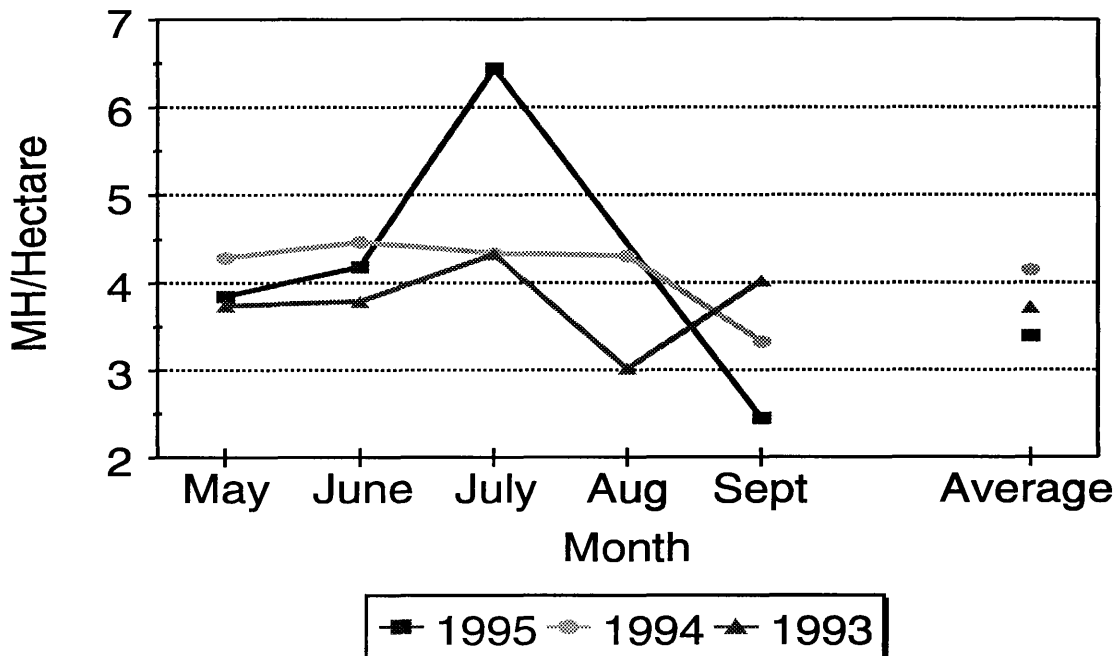
APPENDIX D

LABOR RATES FOR MAINTENANCE ACTIVITIES

142 Primary - Repair NHS Shoulders Labor Rate (Manhours/Metric ton)

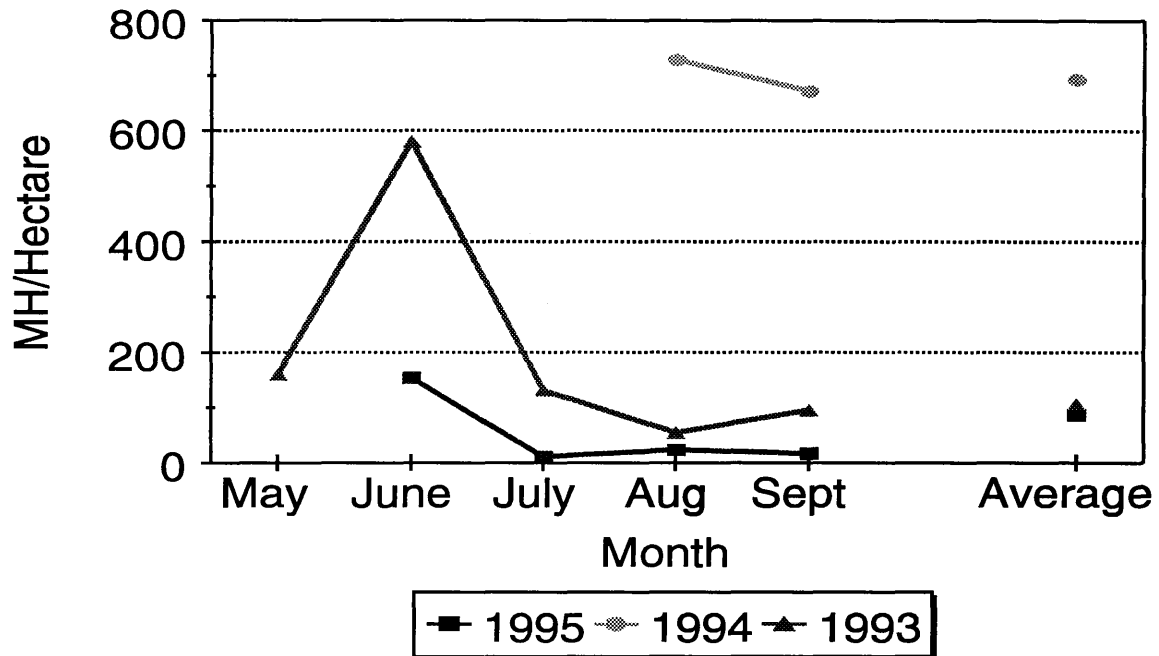


171 Primary - Tractor Mowing Labor Rate (Manhours/Hectare)



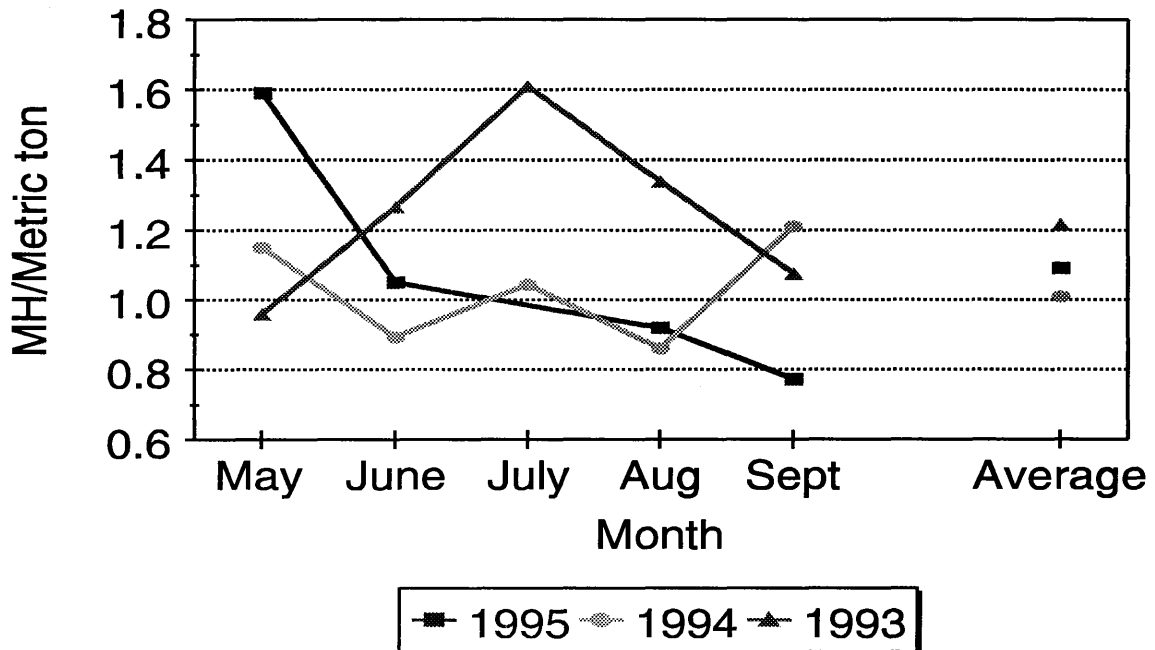
173 Primary - Brush Cutting

Labor Rate (Manhours/Hectare)



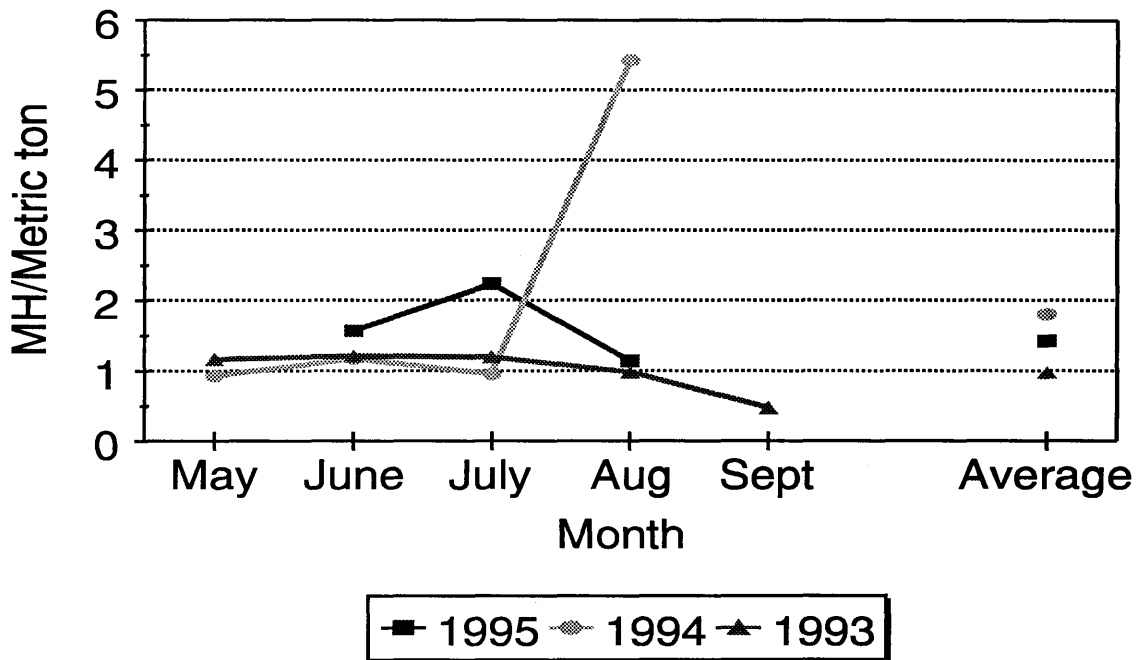
111 Secondary - Skin Patching

Labor Rate (Manhours/Metric ton)



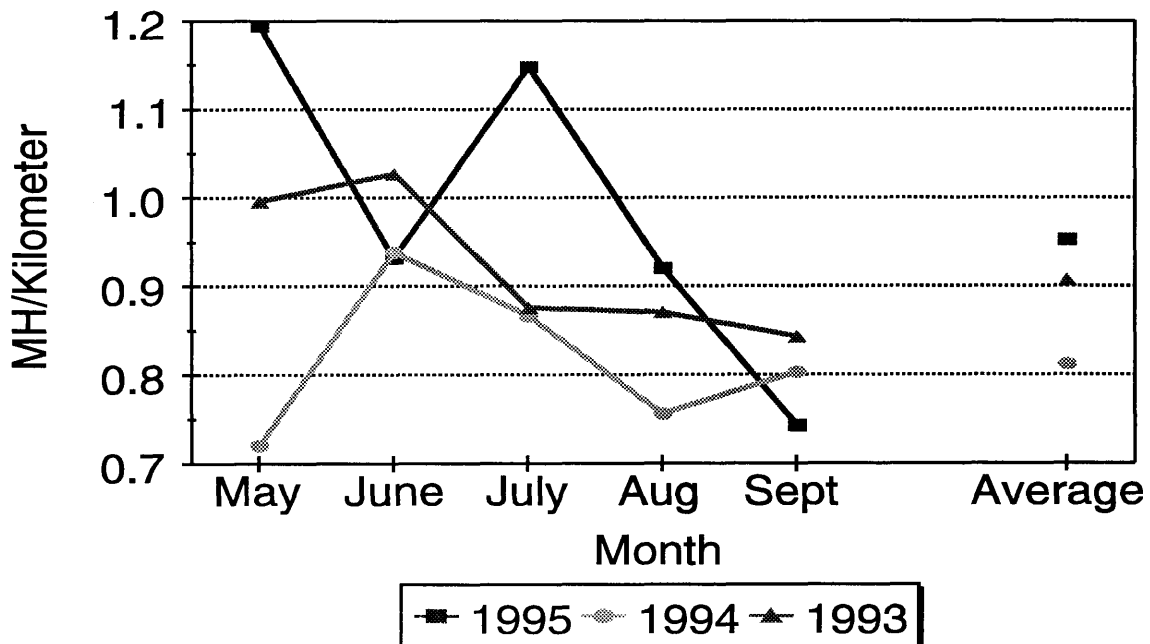
117 Secondary - Mechanized Patching

Labor Rate (Manhours/Metric ton)



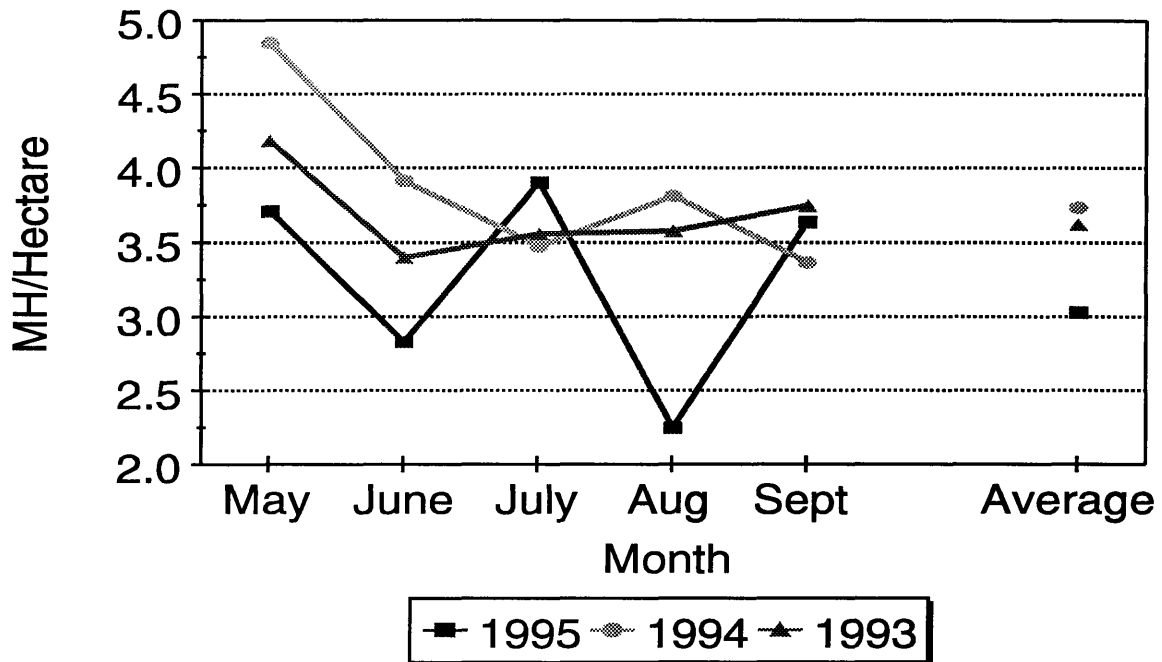
132 Secondary - Machine NHS Roads

Labor Rate (Manhours/Kilometer)



171 Secondary - Tractor Mowing

Labor Rate (Manhours/Hectare)



173 Secondary - Brush Cutting

Labor Rate (Manhours/Hectare)

