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INVESTIGATION OF JOB ATTITUDES FOR  
JOURNEY-LEVEL ENGINEERING TECHNICIANS  
AND TRANSPORTATION ENGINEERS

by

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Susan E. Murphy

for

Washington State Transportation Center

Department of Psychology  
Organizational Research Group  
University of Washington  
Seattle, Washington

April 1987

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FINAL REPORT

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Disclaimer:

The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Washington State Department of Transportation. This report does not constitute a standard, specification, or regulation.

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## EXECUTIVE SUMMARY

A job-satisfaction and morale survey was administered to all journey-level engineering technicians and transportation engineers of the Washington State Department of Transportation (WSDOT). No fewer than 745 of the 837 employees (89%) who received the questionnaires, responded. This unusually high response rate testifies to the salience of the issues covered by this survey, and this conclusion is further supported by the care with which the overwhelming majority of the questionnaires were completed.

Comments about various job-related concerns were obtained in interviews with 15 supervisors, engineers, and engineering technicians in four WSDOT districts and incorporated in a 21-item questionnaire. The questionnaire also asked employees why they might consider leaving WSDOT, and how much longer they planned to stay with WSDOT. Employees were classified on the basis of their tenure, age, district, job classification, ethnic identification, work assignment, and college major.

The questionnaire led to the identification of six areas of satisfaction factors. These are General Satisfaction, Satisfaction with Supervision, Satisfaction with Personnel Practices, Satisfaction with Work Environment, Satisfaction with Equity of Work Conditions, and Involvement with the Department.

General Satisfaction. For the most part, the employees in WSDOT appear reasonably well satisfied. On a 7-point scale with the most favorable point scored 1 and the least favorable point scored 7, overall satisfaction was 3.06 which is slightly less than one scale point above the midpoint of the scale. The employees reported that they were fairly satisfied with their work environment as indicated by a mean of 2.389. This factor included items which assessed work atmosphere and physical working conditions. Satisfaction with supervision also was generally high (2.957) while satisfaction with personnel practices was lower, but still near the midpoint of the scale. The report identifies various subgroups in the organization which express relatively high or low satisfaction with specific aspects of the organization. Most dissatisfaction was expressed with the degree to which the organization utilized work skills and informed employees about WSDOT policies and goals (4.753).

Employees in general report that low pay would be their most important reason for leaving WSDOT. However, 46% said they plan to stay with WSDOT until retirement and 29% said they did not know how long they would remain with WSDOT. The second major concern that would induce employees to leave was a felt lack of personal accomplishment.

Satisfaction by Districts. Significant differences were found among districts on satisfaction with supervision. Satisfaction with personnel practices also differed among districts.

Satisfaction by Position. TE2s reported above average levels of overall satisfaction, while the TE1s reported levels below average. There were no significant differences among job classification for satisfaction with supervision. TE2s reported a much lower level of satisfaction with personnel practices. A further breakdown showed that TE2s in Districts 4 and 5 were below average in satisfaction, as well as those TE2s in types of work other than management service and materials and testing. The tenure of the TT2s also was related to their level of satisfaction. TE2s with over 15 years reported low satisfaction with personnel policies. There were significant differences among employees in different job classifications in satisfaction on items relating to involvement in the department. TE1s reported below average feelings of involvement.

Satisfaction by Type of Work. Employees differed widely in satisfaction, dependent upon their work. Employees in transportation planning and construction reported low satisfaction with supervision. For satisfaction with personnel practices, all employees, except those in management service and materials and testing, reported below average satisfaction. Employees who were classified as "Other" in terms of work were the least satisfied. It would be well to determine whether these particular employees consider themselves orphans in the department. Employees in the remaining classifications reported slightly below average levels of satisfaction. Included in the Satisfaction with Personnel Policies factor were questions addressing the testing procedure at WSDOT and also feelings about the opportunities for advancement. Not surprisingly, satisfaction with work environment differed among the different job types. Again, the "other" category was the least satisfied. Satisfaction with equity of work conditions was positive except for those in construction, transportation planning and "other".

Satisfaction by Gender. In general, males and females were equally satisfied with their jobs at WSDOT. Significant differences were found only for satisfaction with supervision. Female employees reported considerable dissatisfaction with supervision, especially the TT3s. While satisfaction is high in District 6 and Headquarters, others report low satisfaction, especially those working in construction. The other types report only slightly below average levels of satisfaction.

Satisfaction by Age. Differences occur among age groups in the level of involvement with WSDOT. As expected those employees under 25 who have not worked for the organization for a long period of time reported the lowest level of satisfaction.

Satisfaction by Tenure. General satisfaction was the highest for employees who had been with the department for 10 to 20 years and then it decreased slightly as tenure increased. Satisfaction with personnel practices decreased the longer an employee had been with WSDOT. Employees who had worked longer for the department saw inequity in their working conditions,

i.e., heavier workload, and unqualified co-workers. Employees with less than 5 years with WSDOT reported low feelings of involvement.

Satisfaction by Education Level. General satisfaction decreased as education level increased. Education also made a difference in levels of satisfaction with personnel practices. Employees with some postgraduate work were least satisfied with personnel policies and with their work environment. Feelings of involvement with the department decreased as education level increased.

### Summary

While the results indicate generally high job satisfaction and morale, important differences in overall satisfaction are found among the six districts of the Department as well as among job categories, age, sex, and employee education. The report suggests several remedies the management might consider in coping with the undesirable effects of employee dissatisfaction.

## PURPOSE OF THE SURVEY

This study examined the job attitudes of all 837 WSDOT employees classified as TT3, TE1, and TE2. Management wished to determine whether the jobs and working conditions provide a desirable work environment for journey-level engineers and technicians, and to identify methods for increasing the quality of working life and retention of valuable personnel.

## QUESTIONNAIRE DEVELOPMENT AND DATA ANALYSIS

The basic measure of job satisfaction and morale consisted of a 31-item questionnaire, developed in close cooperation with the Personnel and Training Division of WSDOT. The development of questionnaire items was based on information from managers and on extensive interviews with 15 employees from four WSDOT districts. A draft questionnaire was submitted for critique and suggestions by the Personnel Division of WSDOT, and after further revision and approval, a 31-item questionnaire was distributed to all personnel of WSDOT who were classified as TT3, and TE1, and TE2. (See Appendix A.)

About 10 days before distributing the questionnaire, a letter by the Secretary of Transportation, Mr. Duane Berentson, was mailed to all affected employees. This letter explained the purpose and importance of the survey and assured employees that their responses would be treated completely confidential (Appendix A). The questionnaire mailing included an envelope addressed to the Organizational Research Group at the University of Washington which the employee could return by US Mail or through the State of Washington mail service. Approximately 55%



of the questionnaires were returned by US Mail. Two weeks after mailing the questionnaire all employees received a follow-up letter urging them to return the questionnaire if they had not already done so. Of the 837 employees in the target population, no fewer than 89 per cent eventually responded. This unusually high response rate for mail surveys indicates the salience of the issues to employees of the organization.

Content of the Questionnaire. Items 1 to 21 of the questionnaire asked about satisfaction with the job, and commitment to the organization. Respondents marked on a seven-point scale the extent to which each statement is true or untrue. Question 22 asked whether, and for what reasons, the employee had ever considered leaving WSDOT. Question 23 indicated how long the employee planned to remain with the department. Demographic information included age, sex, ethnic identification, length of time with WSDOT, and length of time employed in each of the WSDOT classified positions. The questionnaire also asked about the highest level of education the employee had achieved, and college major, work location (district), and type of work.

#### Analysis of data and interpretation of tables

A factor analysis of the first 21 items yielded six interpretable subscales which represent different components of WSDOT employees' job satisfaction and morale. The items comprising each factor were averaged and the various subgroups of WSDOT employees (e.g., by district, age, sex, etc.) were compared on these factor scores. The factors are shown in Table 1 with a corresponding average raw score. The scale values ranged from 1 to 7, with 1 indicating highest satisfaction. The overall score on the 21 items

for all WSDOT employees was 3.290. Tables 1(a) through 1(f) contain response profiles for each satisfaction factor by district. The profiles give a representative idea of the relative differences in responses. Items comprising each factor are listed in the results section of this report.

Table 1

Interpretable Item Clusters	Average Raw Score
1. General Satisfaction	3.060
2. Quality of Supervision	2.957
3. Satisfaction with Personnel Policies	3.835
4. Satisfaction with Work Environment	2.389
5. Satisfaction with Equity of Work Conditions	3.424
6. Involvement with the Department	4.753

-----  
 Technical Note: Results of Principal Factor Analysis (Eigen Values > 1.00; Items with loadings of .40 are shown in Appendix B along with the rotated factor coefficients. Items which had coefficients of .40 or higher were used to interpret each of the 6 factors.  
 -----

The average factor score was obtained for each of the major subgroups of respondents in WSODT (e.g., districts, age, sex, etc.). using a one-way analysis of variance (ANOVA) to determine whether the differences in responses by various employee subgroups were statistically significant. Nonsignificant results and categories with less than 5 respondents are not reported.

Table 1(a)

Comparison of profiles by district on general satisfaction.

---

			X				
Headquarters	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
			X				
District 1	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
			X				
District 2	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
			X				
District 3	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
			X				
District 4	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
			X				
District 5	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
			X				
District 6	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
			X				

Table 1(b)

Comparison of profiles by district on satisfaction with supervision.

---

Headquarters			X				
	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
District 1			X				
	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
District 2			X				
	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
District 3			X				
	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
District 4			X				
	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
District 5			X				
	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
District 6			X				
	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7

Table 1(c)

Comparison of profiles by district on satisfaction with personnel policies.

---

Headquarters				X			
	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
District 1				X			
	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
District 2				X			
	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
District 3				X			
	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
District 4				X			
	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
District 5				X			
	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
District 6				X			
	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7

Table 1(d)

Comparison of profiles by district on satisfaction with work environment.

---

Headquarters	X						
	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
District 1		X					
	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
District 2			X				
	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
District 3				X			
	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
District 4					X		
	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
District 5						X	
	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
District 6							X
	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7

Table 1(e)

Comparison of profiles by district on satisfaction with equity of work conditions.

---

			X				
Headquarters	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
			X				
District 1	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
			X				
District 2	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
			X				
District 3	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
			X				
District 4	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
			X				
District 5	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
			X				
District 6	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
	1	2	3	4	5	6	7
			X				

Table 1(f)

Comparison of profiles by district for involvement in department.

---

					X		
Headquarters	:---	:---	:---	:---	:---	:---	:---
	1	2	3	4	5	6	7
					X		
District 1	:---	:---	:---	:---	:---	:---	:---
	1	2	3	4	5	6	7
					X		
District 2	:---	:---	:---	:---	:---	:---	:---
	1	2	3	4	5	6	7
					X		
District 3	:---	:---	:---	:---	:---	:---	:---
	1	2	3	4	5	6	7
					X		
District 4	:---	:---	:---	:---	:---	:---	:---
	1	2	3	4	5	6	7
					X		
District 5	:---	:---	:---	:---	:---	:---	:---
	1	2	3	4	5	6	7
					X		
District 6	:---	:---	:---	:---	:---	:---	:---
	1	2	3	4	5	6	7



## Interpreting Results

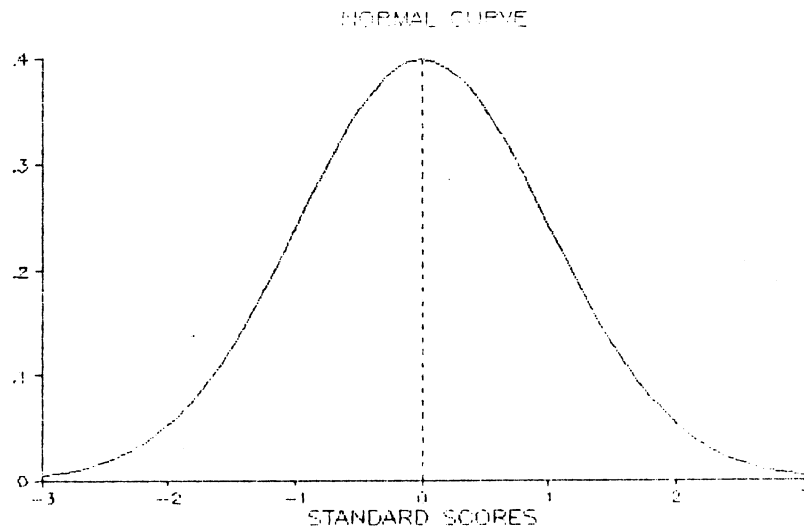
Most tables provide the following information:

- a. Name of factor on which groups are compared
- b. Column 1 lists the specific subgroups (e.g. Districts 1-6, TE1, TE2, etc.)
- c. Column 2 lists factor score in standardized form. This score compares the particular subgroup with the average score of all surveyed WSDOT employees. Thus, if TT3s had received a standard score of .50 on the general satisfaction factor, it would tell us that this subgroup is more satisfied than 69% of all surveyed WSDOT employees. If the factor score would be -.50, it would indicate that the subgroup is no more satisfied than 31% of all surveyed WSDOT employees. For readers who prefer to think in percentiles, Figure 1 converts standard scores to percentiles within the range of this survey.
- c. Column 3 reports the standard deviation (Std. Dev.) for the group. A small standard deviation shows that the employees in a particular subgroup or category are very unanimous in holding a particular view; a large standard deviation shows that some employees hold relatively favorable opinions while others hold relatively unfavorable opinions.
- d. Column 4 reports the responses in the particular subgroup or employee category. NOTE: To assure anonymity of respondents, data are not reported for subgroups in which there are fewer than 5 employees.
- e. Column 5 reports the average of the factor score. Thus, a score of 3.0 in this column indicates that the group mean on that score falls on the "Slightly True" point on the scale. (Note example, page 9.)

Figure 1

Equivalents of Standard Scores and Percentile Scores

Standard Score	Percentile Score (% of employees have a <u>lower</u> score)
-1.0	16
-.9	18
-.8	21
-.7	24
-.6	27
-.5	31
-.4	34
-.3	38
-.2	42
-.1	46
.0	50
.1	54
.2	58
.3	62
.4	66
.5	69
.6	73
.7	76
.8	79
.9	82
1.0	84



## RESULTS

This section describes Factor 1, "General Satisfaction", and differences within WSDOT on this factor.

### Factor 1--General Satisfaction

- Item 1 My current job provides me with challenging and interesting problems.
- Item 2 In my current job, I am left to do my own work most of the time.
- Item 3 For the most part, my career with the Department has been what I had expected it to be.
- Item 4 Overall, I find my work to be very satisfying.
- Item 6 The interesting nature of my job does much to compensate for other possible disadvantages.
- Item 8 I feel my knowledge and skills are underutilized in my current job assignment.
- Item 11 I feel a lot of pride as an employee of the Department of Transportation.
- Item 12 I enjoy the level of responsibility I am given in my job.

Factor 1 is a measure of general satisfaction. The average raw scale response for the 8 items making up Factor 1 was a 3.060 as indicated on the scale below.

Average Response on Factor 1

:	:	:X	:	:	:	:
-----						
1	2	3	4	5	6	7
Definitely true	Moder. true	Slightly true	Neither true nor untrue	Slight untrue	Moder. untrue	Definitely untrue

### Job Satisfaction Ratings by Job Classification:

Engineering technicians and TEs were least satisfied while employees at the TE2 level were most satisfied. (See Table 2 and Figure 2.) Engineering technicians and TEs are therefore most vulnerable to offers from other organizations.

Employees at the TE1 level are recent college graduates who may feel that they have not yet found the "right" job.

FIGURE 2  
GENERAL SATISFACTION

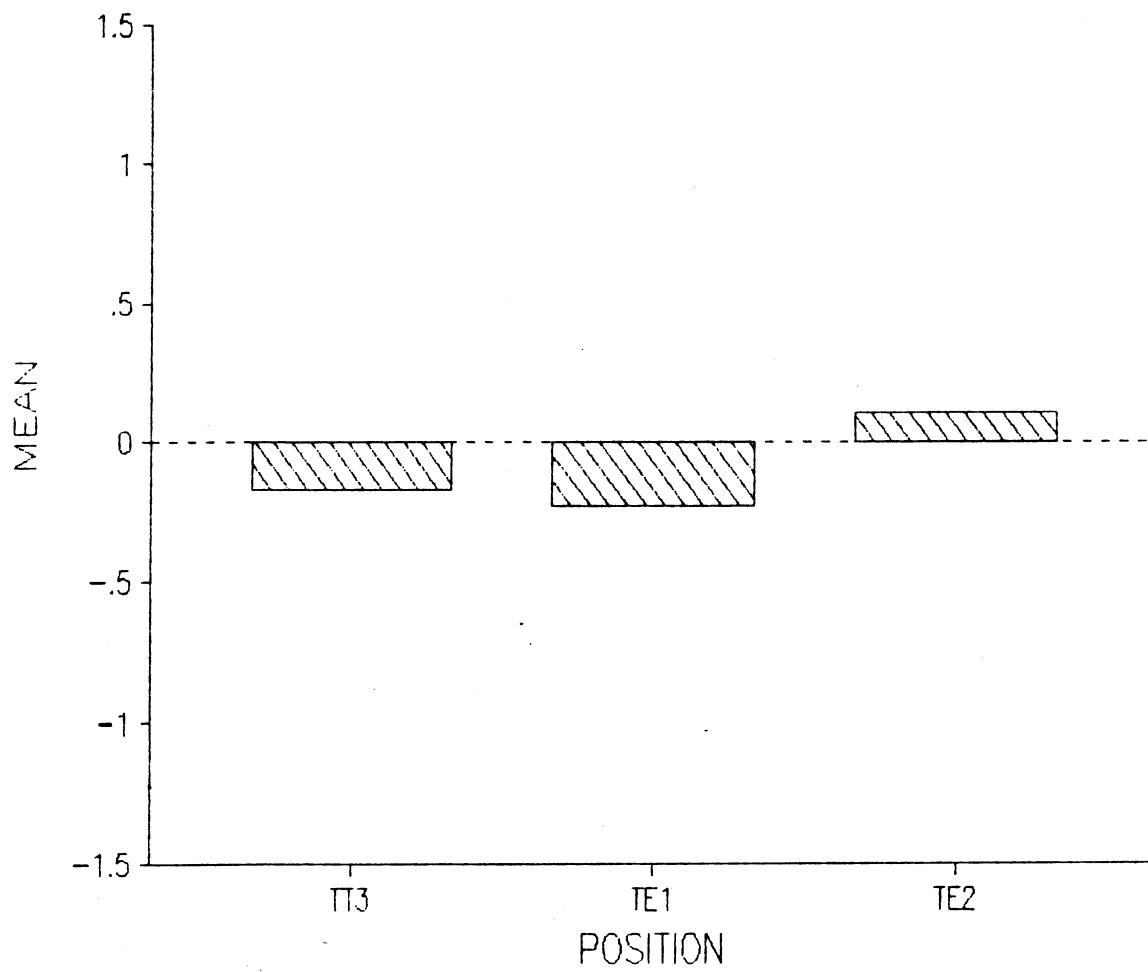


TABLE 2

## General Satisfaction and Position

	Mean	Std. Dev.	Cases	Approximate Raw Score
TT3	-.172	1.109	188	3.180
TE1	-.231	.984	70	3.241
TE2	.104	.944	409	2.987

F=3.56, p=.007  
(Score range for Factor 1: -3.769 to +2.204)

Education Level:

Question 23 asked employees to indicate their education level. Those with an education level above the bachelor's degree reported substantially less satisfaction than employees with less education. (See Table 3 and Figure 3.) Further analysis examined the major area of study for employees with some post graduate work and those who had completed a post graduate degree. Of the 37 employees with some postgraduate education (but not a degree) approximately half had education in civil engineering (n=20). The mean score on general satisfaction for this group was -.619. This indicates slightly less general satisfaction than employees with other majors (Mean=-.181, n=17). For the 26 employees who completed a postgraduate degree, 14 majored in civil engineering. Their mean general satisfaction score was -.441 which was not significantly different from that of employees with postgraduate degrees in other areas.

The relatively low job satisfaction of engineers with most academic training suggests a serious problem in their morale and the possibility of losing the services of these highly trained individuals if reasonable alternative employment is offered.

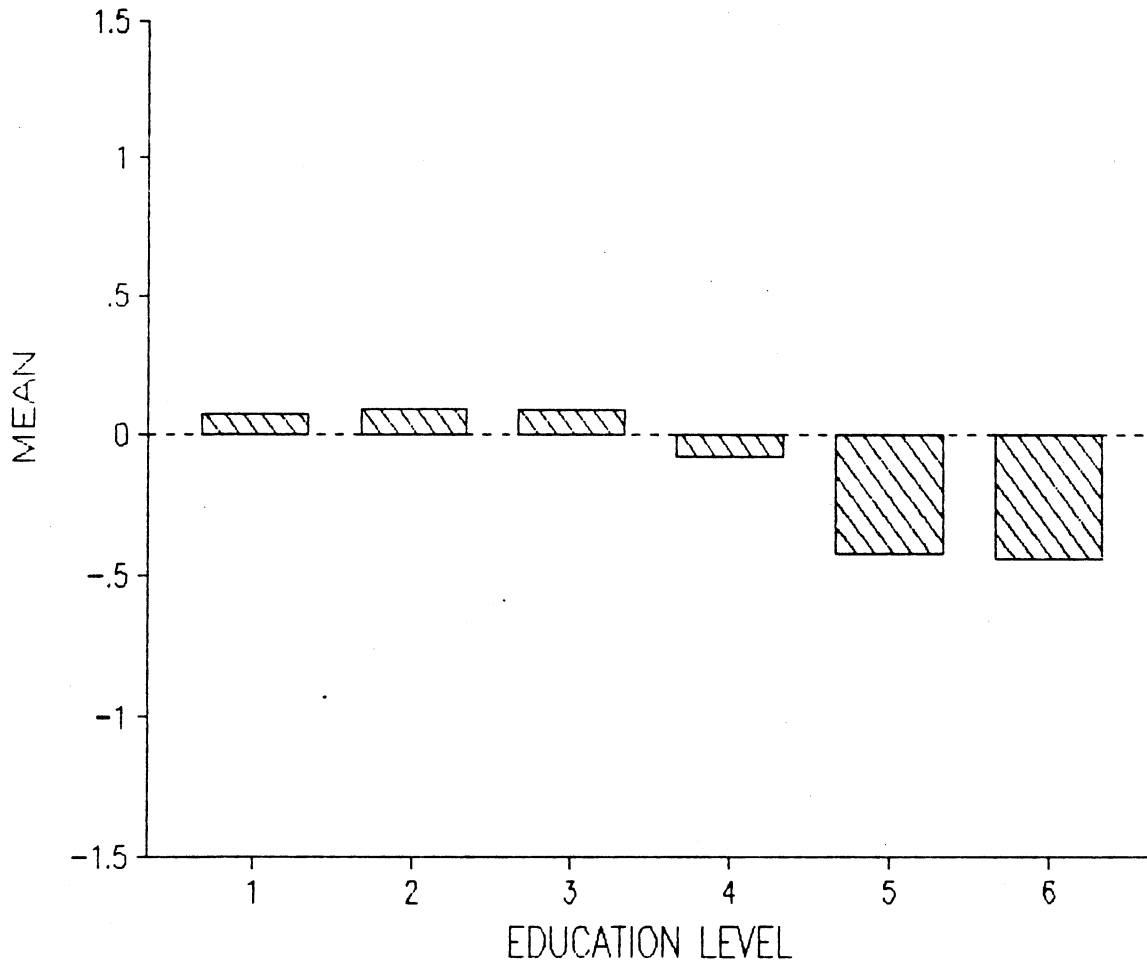
TABLE 3

## General Satisfaction and Education Level

Education Level	Mean	Std.Dev.	Cases	Approximate Raw Score
High School Graduate	.077	.908	78	2.886
Some College	.093	.979	229	2.990
Associate Degree	.089	.982	128	3.038
Bachelor's Degree	-.075	.974	192	3.079
Some Postgraduate Work	-.419	1.152	37	3.635
Postgraduate Degree	-.444	1.369	26	3.551

F=3.25, p=.007

FIGURE 3  
GENERAL SATISFACTION



- 1 HIGH SCHOOL GRADUATE
- 2 SOME COLLEGE
- 3 ASSOCIATE DEGREE
- 4 BACHELOR'S DEGREE
- 5 SOME POST GRADUATE WORK
- 6 POST GRADUATE DEGREE

Commitment to the Organization:

Question 23 asked employees to indicate how long they plan to stay with WSDOT. As expected, those who plan to remain less than one year are most dissatisfied. (See Table 4 and Figure 4.) Those who plan to remain until retirement are most satisfied. While this particular item presents no new or exciting information, it does show that the scale has validity and that the respondents took the survey seriously.

TABLE 4

General Satisfaction and Plans to remain with WSDOT

How long the employee plans to stay	Mean	Std. Dev.	Cases	Approximate Raw Score
Under a year	-1.071	1.332	26	4.227
At least 3 years	-.125	1.019	85	3.125
At least 5 years	.028	1.160	48	3.017
At least 10 years	.038	.744	24	2.929
Until Retirement	.302	.775	314	2.881
Unsure	-.292	1.058	202	2.535

F=14.53, p=.00

Type of Work:

Question 29 examined the satisfaction and morale of employees performing different types of engineering work. Those in Management Services and Transportation Planning reported very low general satisfaction. (See Table 5 and Figure 5.) As the standard deviations show, there was considerable variation in how Planning Division employees felt about their work. However, the standard deviation is quite small for management services employees, indicating that most of these employees are dissatisfied with their jobs.

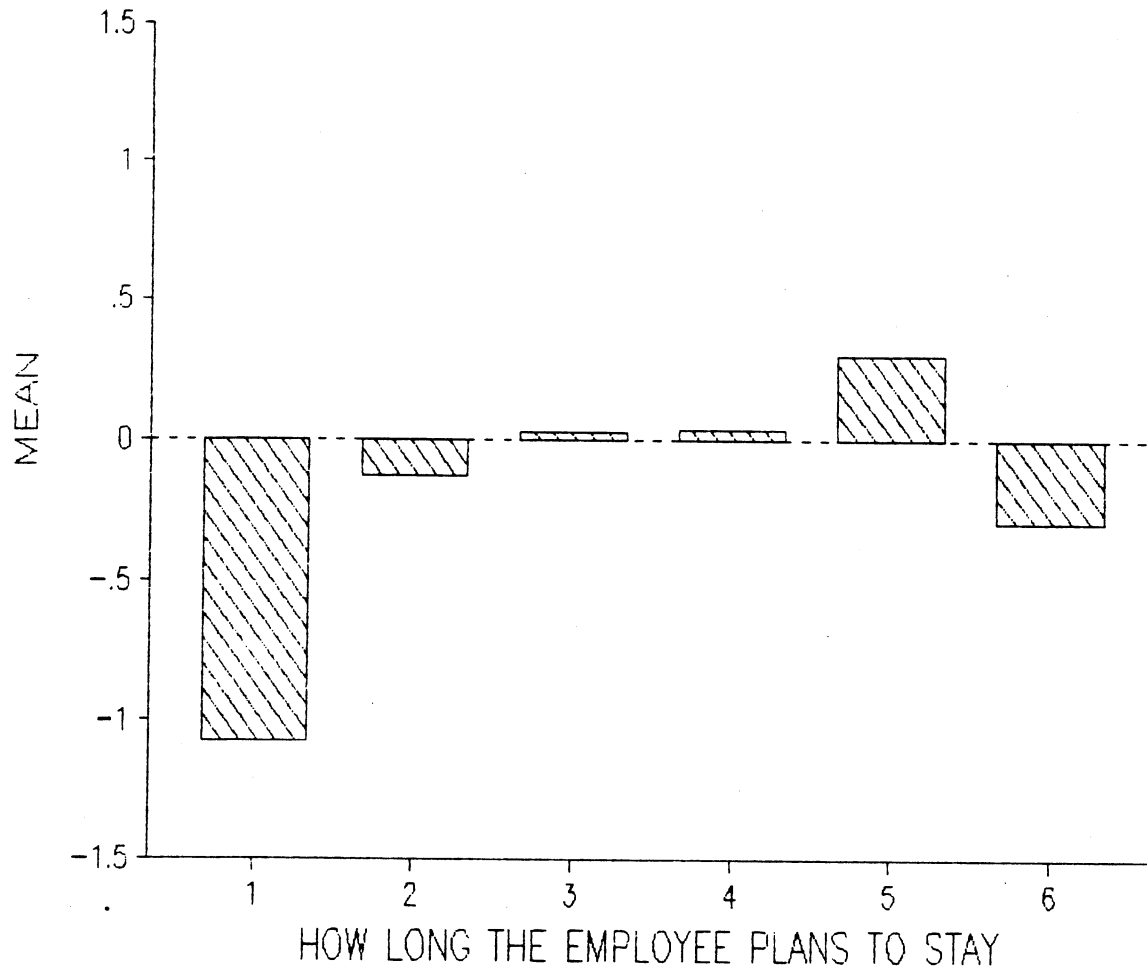
TABLE 5

General Satisfaction and Type of Work

Type of Work	Mean	Std. Dev.	Cases	Approximate Raw Score
Construction	-.003	.962	304	3.110
Plans/Design	.066	.941	230	2.962
Management Service	-.706	.748	12	3.546
Materials & Testing	-.267	1.372	38	3.188
Transportation Planning	-.638	1.599	6	3.926
Traffic Engineering	.049	.987	32	2.983
Other	.155	1.003	58	2.987

F=2.33, p=.03

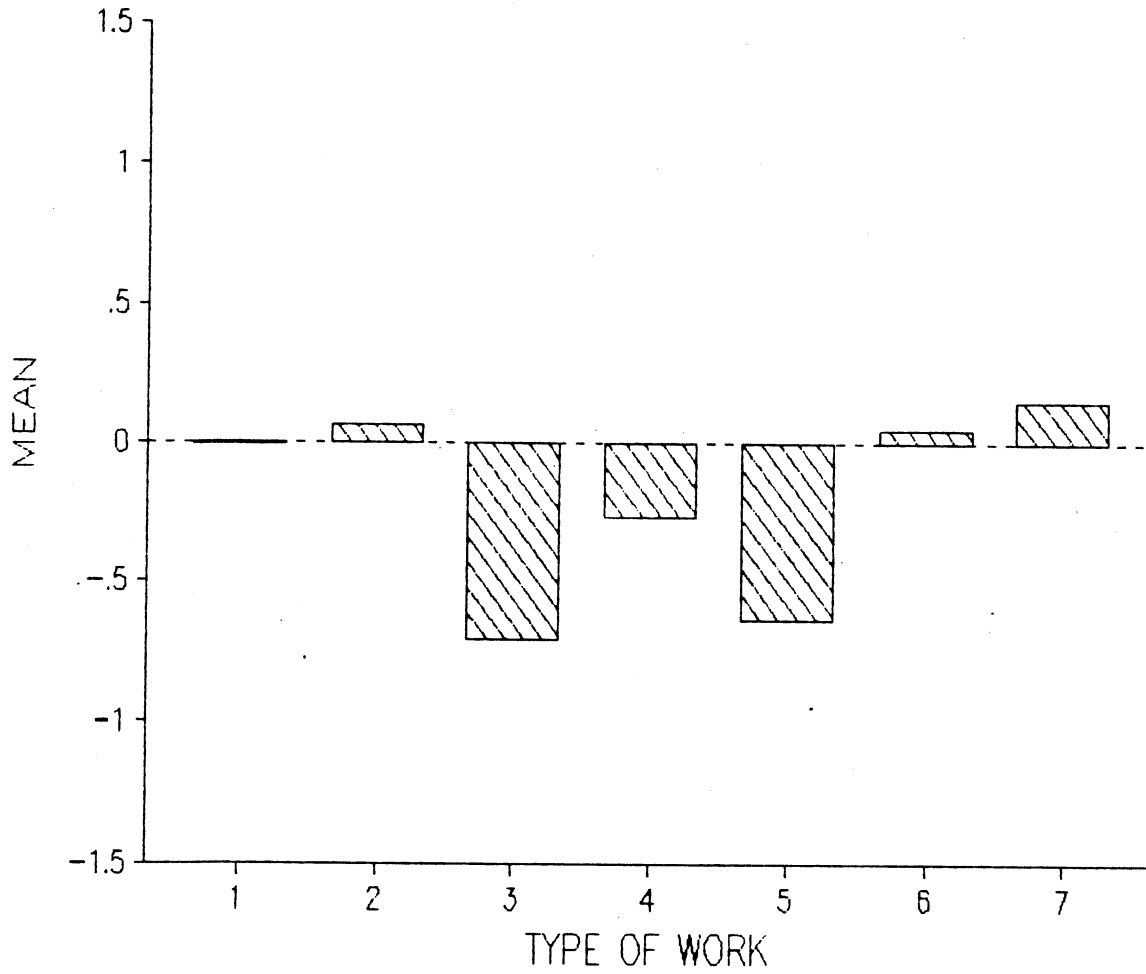
FIGURE 4  
GENERAL SATISFACTION



- 1 UNDER A YEAR
- 2 AT LEAST 3 YEARS
- 3 AT LEAST 5 YEARS
- 4 AT LEAST 10 YEARS
- 5 UNTIL RETIREMENT
- 6 UNSURE



FIGURE 5  
GENERAL SATISFACTION



- 1 CONSTRUCTION
- 2 PLANS/DESIGN
- 3 MANAGEMENT SERVICE
- 4 MATERIALS & TESTING
- 5 TRANSPORTATION PLANNING
- 6 TRAFFIC ENGINEERING
- 7 OTHER

Tenure:

Employees who have worked for the department 10 years or less report a lower level of general satisfaction than employees who have worked 11 to 20 years. (See Table 6 and Figure 6.) Employees who are dissatisfied are, of course, apt to leave before 10 years in an organization.

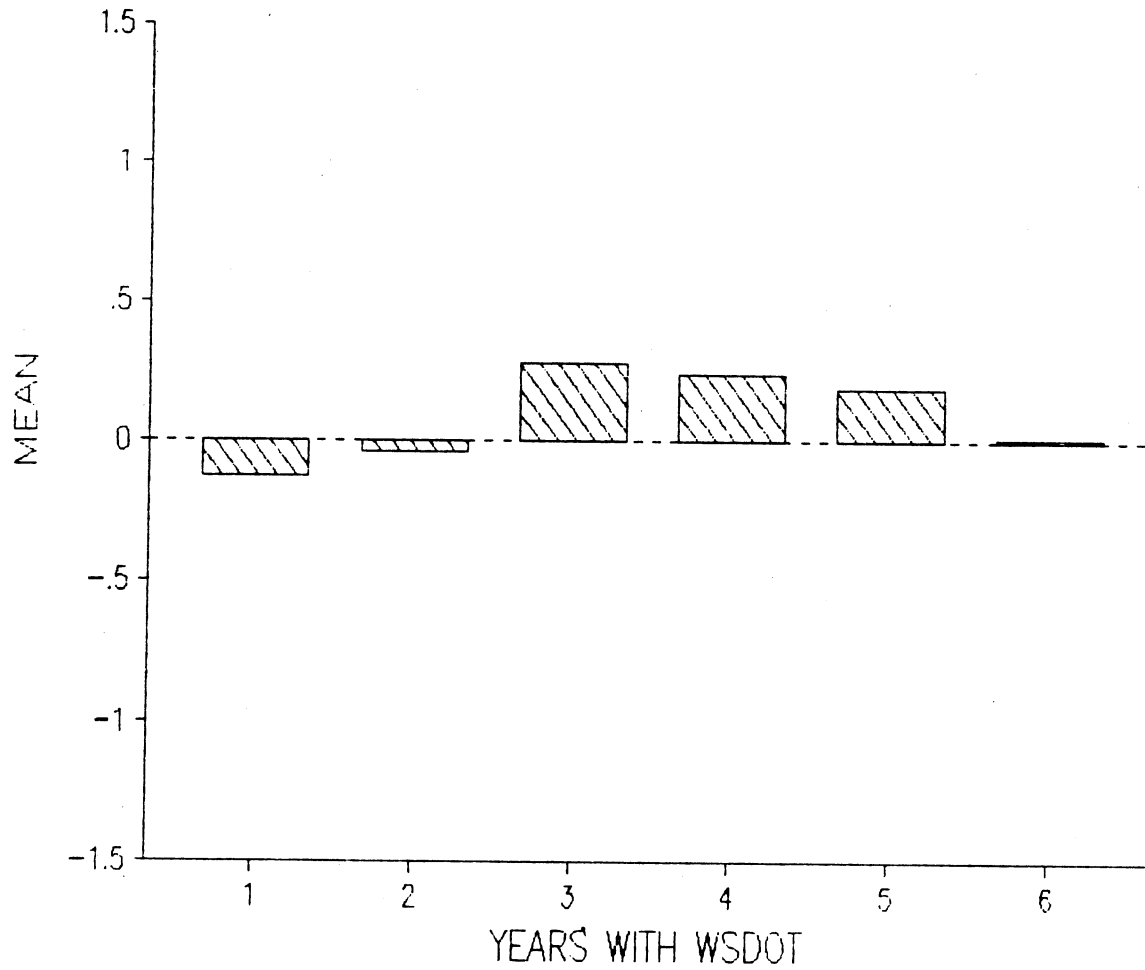
TABLE 6

General Satisfaction and Tenure

Years with WSDOT	Mean	Std. Dev.	Cases	Approximate Raw Scores
1 to 5 years	-.127	1.043	301	3.137
6 to 10 years	-.040	1.067	210	3.156
11 to 15 years	.278	.701	31	2.660
16 to 20 years	.239	.763	83	2.822
21 to 25 years	.188	.889	39	3.172
26 years and over	.009	.945	8	2.873

F=2.15, p=.037

FIGURE 6  
GENERAL SATISFACTION



- 1 1 TO 5 YEARS
- 2 6 TO 10 YEARS
- 3 11 TO 15 YEARS
- 4 16 TO 20 YEARS
- 5 21 TO 25 YEARS
- 6 26 YEARS AND OVER

**Factor 2--Satisfaction with Supervision**

- Item 5 I feel that I am getting the proper amount of instruction and assistance from my supervisor.
- Item 7 I feel adequately informed about the projects or programs on which I am working.
- Item 15 I feel my supervisor supports and helps me in my work.
- Item 18 I feel my supervisor to be well qualified for his job.

Factor 2 is a measure of satisfaction with supervision. On average, all employees responded to the four items for Factor 2 with a mean response of 2.957.

Example: Overall, I am satisfied with my supervision.

:	:	X:	:	:	:	:
-----						
1	2	3	4	5	6	7
Definitely true	Moder. true	Slightly true	Neither true nor untrue	Slight untrue	Moder. untrue	Definitely untrue

Satisfaction by District

Employees working at Headquarters in Olympia and District 2 were more satisfied with supervision than were employees from District 3 and 5. (See Table 7 and Figure 7.)

TABLE 7

Satisfaction with Supervision and Location

Location	Mean	Std Dev	Cases	Approximate Raw Scores
District 1	.072	1.009	276	2.895
District 2	.199	.787	35	2.632
District 3	-.183	1.016	135	3.153
District 4	-.044	1.055	80	3.044
District 5	-.219	.901	76	3.208
District 6	.068	.903	35	2.816
Headquarters	.241	1.092	47	2.653

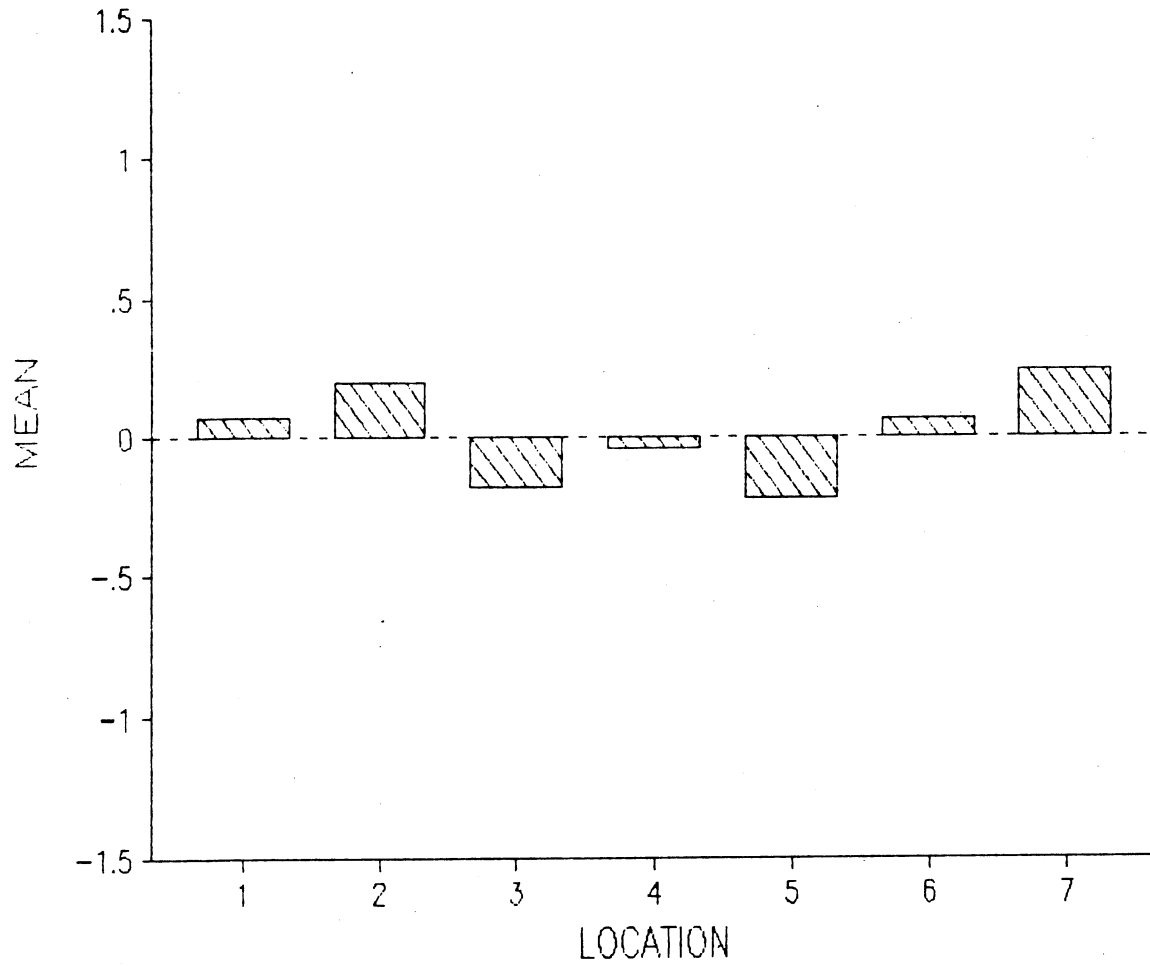
F=2.35, p=.029

(Score range for Factor 2: -3.696 to +2.293)

Sex Differences in Satisfaction with Supervision:

Female employees were significantly less satisfied with supervision than were males. (See Table 8 and Figure 8.) This important difference requires attention. The number of female employees is too small to pinpoint to source of their dissatisfaction, but an analysis of these data by various demographic variables shows some differences.

FIGURE 7  
SATISFACTION WITH SUPERVISION



- 1 DISTRICT 1
- 2 DISTRICT 2
- 3 DISTRICT 3
- 4 DISTRICT 4
- 5 DISTRICT 5
- 6 DISTRICT 6
- 7 HEADQUARTERS

FIGURE 8  
SATISFACTION WITH SUPERVISION

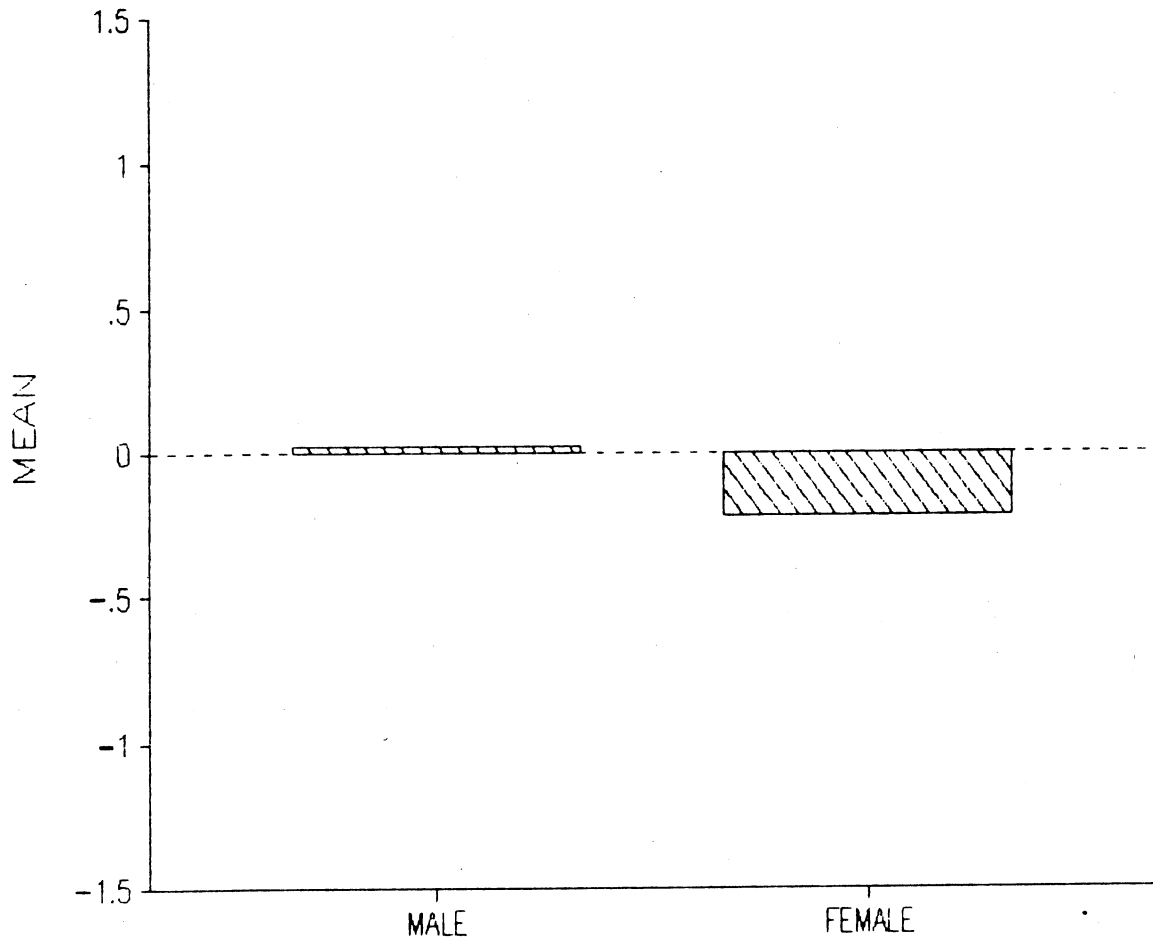


TABLE 8

## Satisfaction with supervision

	Mean	Std. Dev.	Cases	Approximate Raw Scores
Male	.020	.997	603	2.938
Female	-.218	1.029	77	3.212

F=3.86, p=.05

A break-down of female employee responses by job classification results in significant differences in satisfaction with supervision (See Table 9 and Figure 9). TT3s, and TE1s report lower satisfaction with supervision than do all females (Mean=-.423 versus overall -.218). Females in the TE2 positions report a slightly above average level of satisfaction (TE2: Mean=.108).

TABLE 9

## For Females Only: Satisfaction with supervision

Position	Mean	Std. Dev	Cases
TT3	-.445	1.110	33
TE1	-.339	.856	14
TE2	.108	.972	29

F=3.66, p=.05

Differences are found in different districts in the satisfaction with supervisor reported by female employees. Females most dissatisfied were those working in District 3, i.e., -.584 (See Table 10 and Figure 10). Females in Districts 2 and 6 along with Headquarters had relatively higher satisfaction.

TABLE 10

## For Females Only: Satisfaction with supervision

Location	Mean	Std. Dev.	Cases
District 1	-.258	.940	31
District 3	-.584	1.158	18
District 4	-.189	1.252	7
District 5	-.308	.979	10
District 6			
Headquarters			

F=5.00, p=.03 (Categories with less than 5 deleted.)

FIGURE 9  
SATISFACTION WITH SUPERVISION (FEMALES)

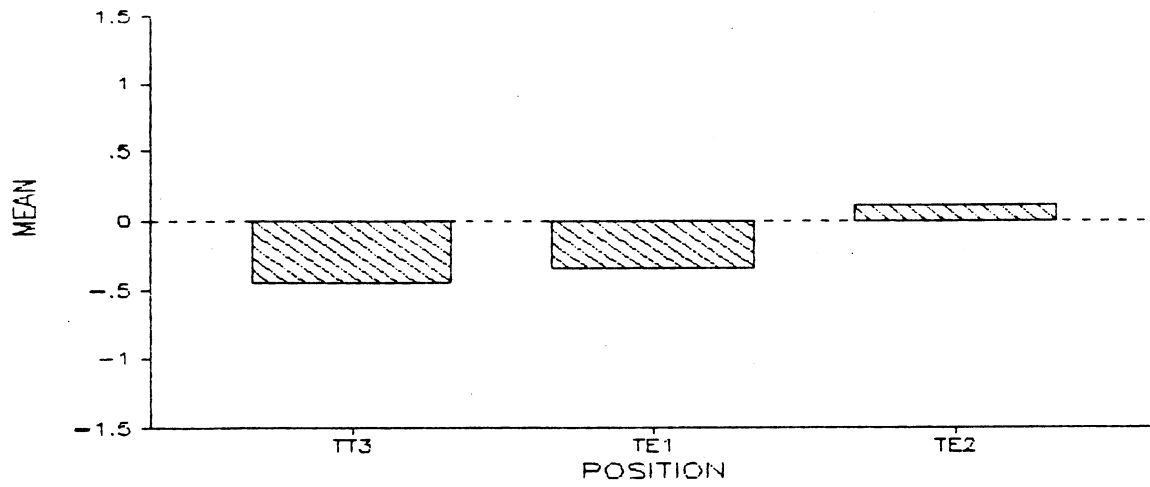
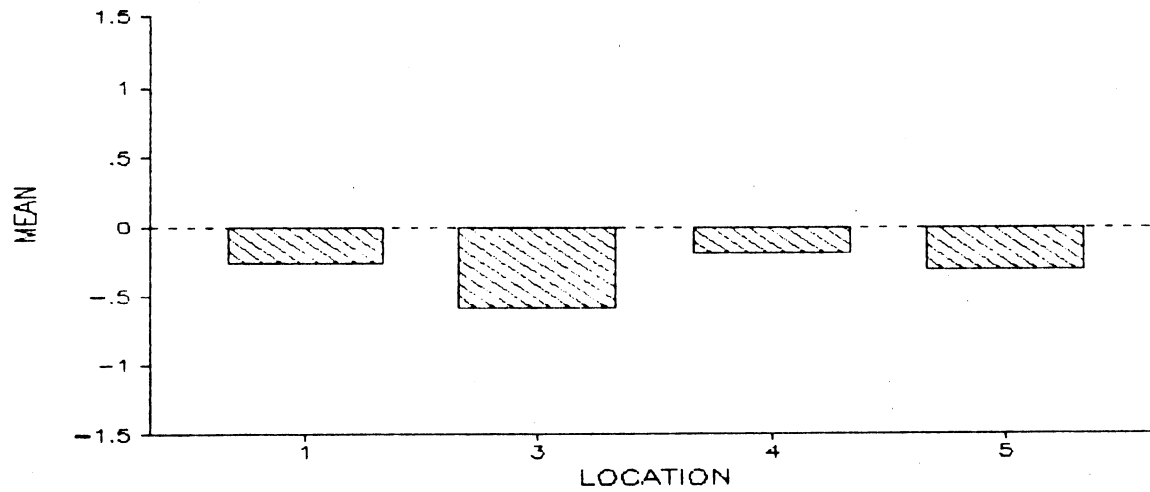


FIGURE 10  
SATISFACTION WITH SUPERVISION (FEMALES)



- 1 DISTRICT 1
- 3 DISTRICT 3
- 4 DISTRICT 4
- 5 DISTRICT 5



The type of work the female employees do also affects satisfaction with supervision. (See Table 11 and Figure 11). Female employees working in the construction area report very low satisfaction. Females in Plans and Design report slightly above average satisfaction. The differences in location may be a direct result of the type of work most prevalent at the district. Female TT3 employees at District 3 who work in construction show lower satisfaction than all females who work in construction (Mean=-.678).

TABLE 11  
For Females Only: Satisfaction with supervision

Type of Work	Mean	Std. Dev.	Cases
Construction	-.517	1.150	30
Plans/Design	-.180	.894	34
All others	.372	.721	13
Management Services	---	---	
Materials & Testing	---	---	
Transportation			
Planning	---	---	
Traffic Engineering	---	---	

F=3.91, p=.05 (Categories with less than 5 combined in "All others".)

Present Type of Work:

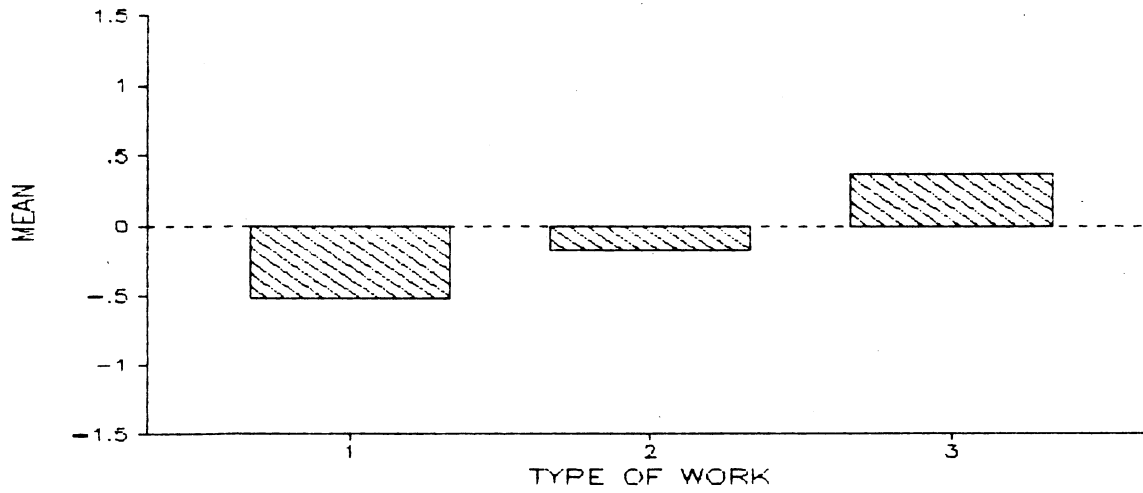
Employees involved in transportation planning were least satisfied with their supervision, while those in Traffic Engineering reported most satisfaction. (See Table 12 and Figure 12.)

TABLE 12  
Satisfaction with supervision

Type of Work	Mean	Std. Dev.	Cases	Approximate Raw Scores
Construction	-.167	1.048	306	3.145
Plans/Design	.093	.914	232	2.803
Management Service	-.081	1.519	12	3.044
Materials & Testing	.009	.963	39	3.043
Transportation				
Planning	-.288	1.056	6	3.750
Traffic Engineering	.489	.788	32	2.485
Other	.197	.941	58	2.788

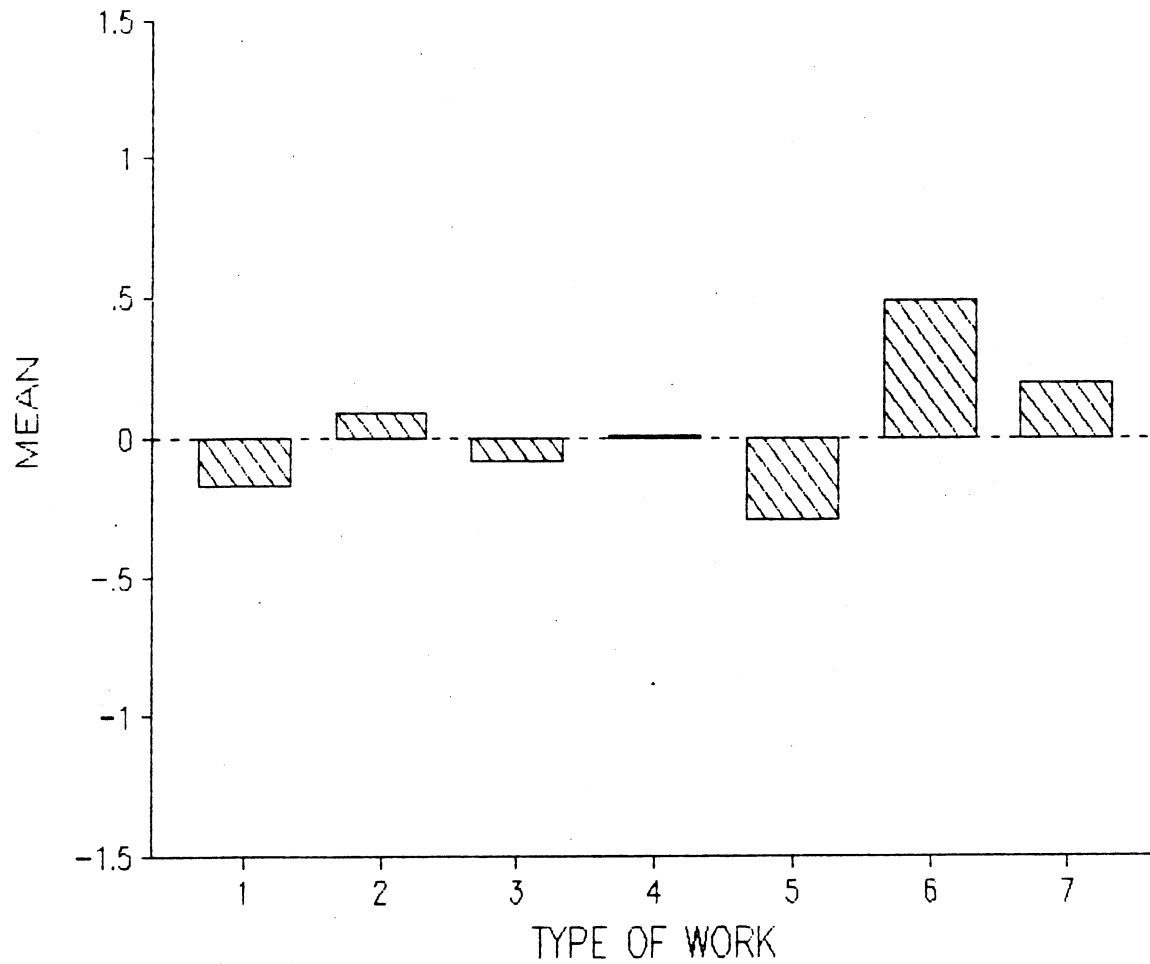
F=3.58, p=.002

FIGURE 11  
SATISFACTION WITH SUPERVISION (FEMALES)



- 1 CONSTRUCTION
- 2 PLANS/DESIGN
- 3 ALL OTHERS
  - MANAGEMENT SERVICES
  - MATERIALS & TESTING
  - TRANSPORTATION PLANNING
  - TRAFFIC ENGINEERING

FIGURE 12  
SATISFACTION WITH SUPERVISION



- 1 CONSTRUCTION
- 2 PLANS/DESIGN
- 3 MANAGEMENT SERVICE
- 4 MATERIALS & TESTING
- 5 TRANSPORTATION PLANNING
- 6 TRAFFIC ENGINEERING
- 7 OTHER

**Factor 3-Satisfaction with Personnel Practices**

- Item 10 The opportunities for advancement within the organization are very good.
- Item 11 I feel a lot of pride as an employee of the Department of Transportation.
- Item 19 I am satisfied with the testing procedures at DOT.

Factor 3 measures is interpreted as satisfaction with WSDOT's organization and general personnel practices. For all employees, the average raw score for the three items making up Factor 3 was a 3.835 as indicated on the scale below.

:	:	:	X :	:	:	:
1	2	3	4	5	6	7
Definitely true	Moder. true	Slightly true	Neither true nor untrue	Slight untrue	Moder. untrue	Definitely untrue

Job Classification:

From the mean responses presented in Table 13 and Figure 13, employees in the TT3 classification reported slightly above average satisfaction, and TE2 reported a level of satisfaction slightly below average.

TABLE 13

Satisfaction with personnel policies

	Mean	Std. Dev.	Cases	Approximate Raw Score
TT3	.252	.987	188	3.633
TE1	.154	.984	70	3.662
TE2	-.149	.981	409	3.969

F=6.36, p=.000  
(Score range for Factor 3: -2.948 to 3.402)

A closer examination of the TE2 responses reveals significant differences in levels of satisfaction with personnel practices for different districts, types of work, and tenure. TE2s report low satisfaction with personnel practices in Districts 4 and 5 and high satisfaction in District 6. (See Table 14 and Figure 14.) Personnel practices for TE2s may be implemented differently in the various districts, and this bears investigation.

FIGURE 13  
SATISFACTION WITH PERSONNEL PRACTICES

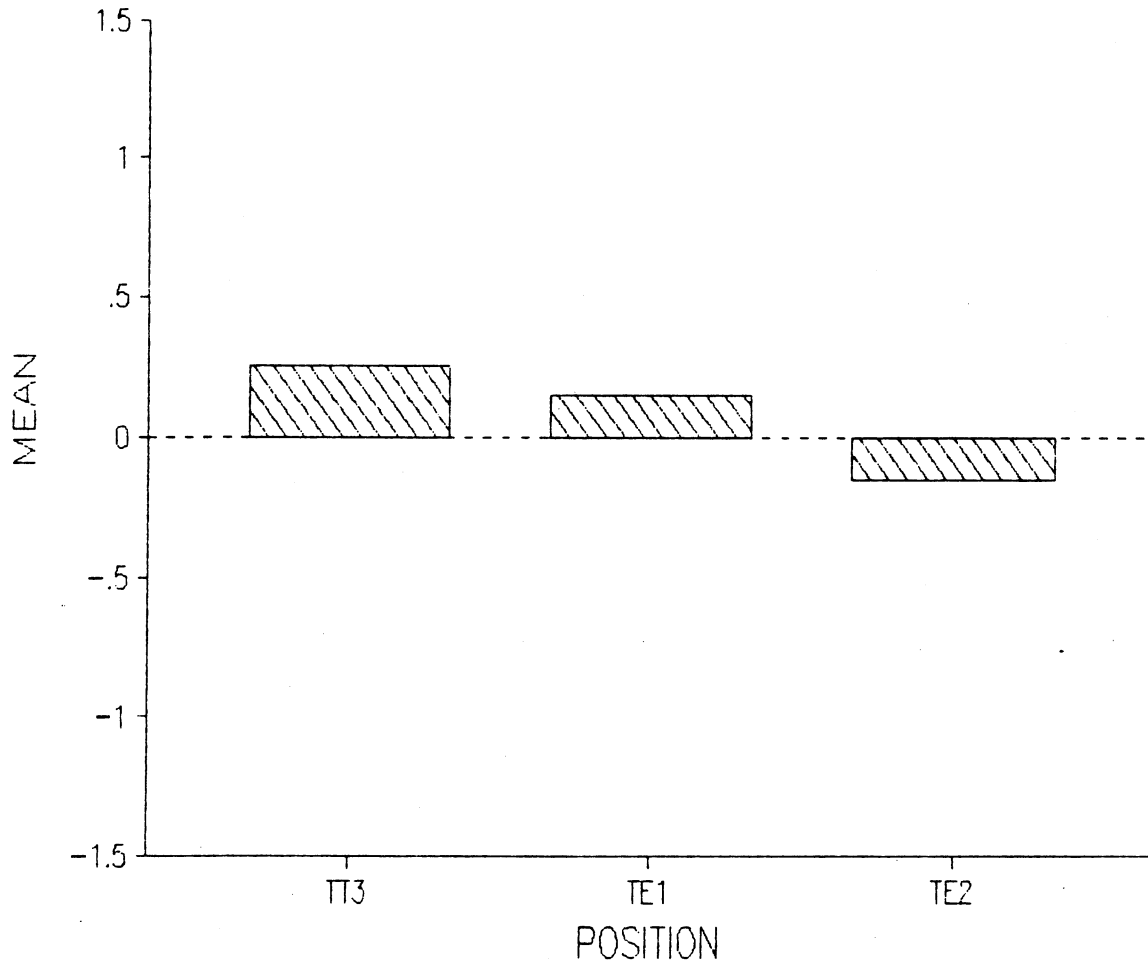


TABLE 14

For TE2s Only: Satisfaction with personnel practices

Location	Mean	Std Dev	Cases	Approximate Raw Score
District 1	-.191	.946	167	4.039
District 2	.141	1.142	23	3.560
District 3	.019	.950	76	3.662
District 4	-.387	.887	46	4.327
District 5	-.349	.968	44	4.326
District 6	.547	.960	17	3.093
Headquarters	-.178	1.059	33	3.912

F=3.04, p=.006

The type of work also seems to make a difference (See Table 15 and Figure 15). Employees in Transportation Planning, and those who categorize their work as "Other", report fairly low satisfaction. These findings may be caused by poor opportunities for advancement, ambiguities or conflicts experienced by employees in the TE2 category, or their particular functions. We suggest that management investigate the causes of this dissatisfaction.

TABLE 15

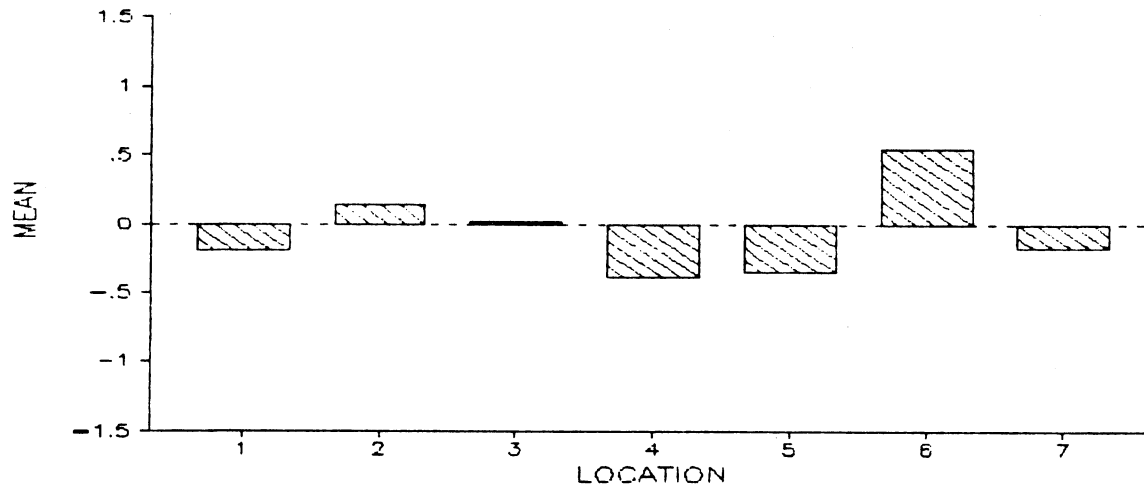
For TE2s Only: Satisfaction with personnel practices

Type of Work	Mean	Std. Dev.	Cases	Approximate Raw Scores
Construction	-.140	.999	181	3.875
Plans/Design	-.169	.945	134	3.885
Management Service	.378	.925	10	3.500
Materials & Testing	.150	.827	16	3.625
Transportation Planning	-.874	1.417	6	4.778
Traffic Engineering	-.239	.947	22	4.101
Other	-.648	.901	40	4.619

F=3.25, p=.004

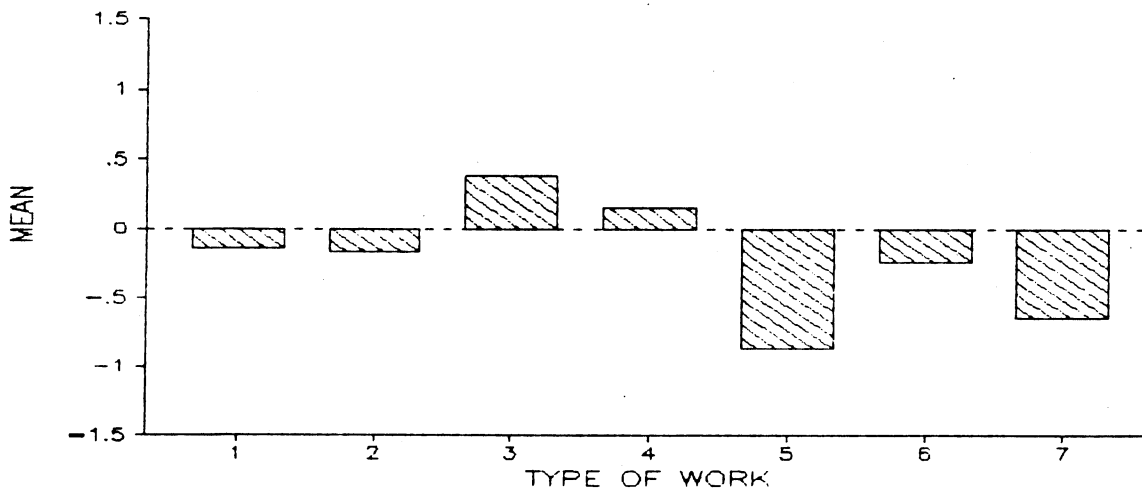
Tenure makes a difference in TE2's level of satisfaction (See Table 16 and Figure 16). TE2s who have worked for WSDOT for over 15 years have low satisfaction. Item 19 which addresses opportunities for advancement suggests that TE2s who have been with WSDOT for over 15 years feel that they have reached a plateau at the TE2 level, and this indeed may be the case. To alleviate dissatisfaction at this level, some type of job enrichment programs may need to be developed to keep these employees satisfied with the department.

FIGURE 14  
SATISFACTION WITH PERSONNEL PRACTICES (TE2'S)



- 1 DISTRICT 1
- 2 DISTRICT 2
- 3 DISTRICT 3
- 4 DISTRICT 4
- 5 DISTRICT 5
- 6 DISTRICT 6
- 7 HEADQUARTERS

FIGURE 15  
SATISFACTION WITH PERSONNEL PRACTICES (TE2'S)



- 1 CONSTRUCTION
- 2 PLANS/DESIGN
- 3 MANAGEMENT SERVICE
- 4 MATERIALS & TESTING
- 5 TRANSPORTATION PLANNING
- 6 TRAFFIC ENGINEERING
- 7 OTHER

TABLE 16

For TE2s Only: Satisfaction with personnel practices

Years with WSDOT	Mean	Std. Dev.	Cases	Approximate Raw Scores
1 to 5 years	-.040	.935	132	3.847
6 to 10 years	-.070	.988	135	3.913
11 to 15 years	.205	.928	25	3.449
16 to 20 years	-.334	.956	74	4.108
21 to 25 years	-.646	1.033	33	4.312
26 years and over			5	

F=3.97, p=.000

Districts:

Employees in District 6 reported most satisfaction with personnel practices. (See Table 17 and Figure 17.) Districts 4 and 5 reported least satisfaction. The differences between districts are quite marked. It seems clear that the districts (4 and 5) further away from headquarters are not satisfied with organizational policies. It may be because the policies in their district are implemented differently. Also, the new highway construction in District 1 may be seen as the organization's central concern. However, employees in District 6, also away from headquarters, are satisfied.

TABLE 17

Satisfaction with Personnel Practices

Location	Mean	Std Dev	Cases	Approximate Raw Score
District 1	-.032	.993	276	3.889
District 2	.248	1.103	35	3.514
District 3	.135	.981	135	3.605
District 4	-.253	.878	80	4.188
District 5	-.270	.967	76	4.228
District 6	.527	.958	35	3.315
Headquarters	.098	1.062	47	3.585

F=4.43, p=.0002

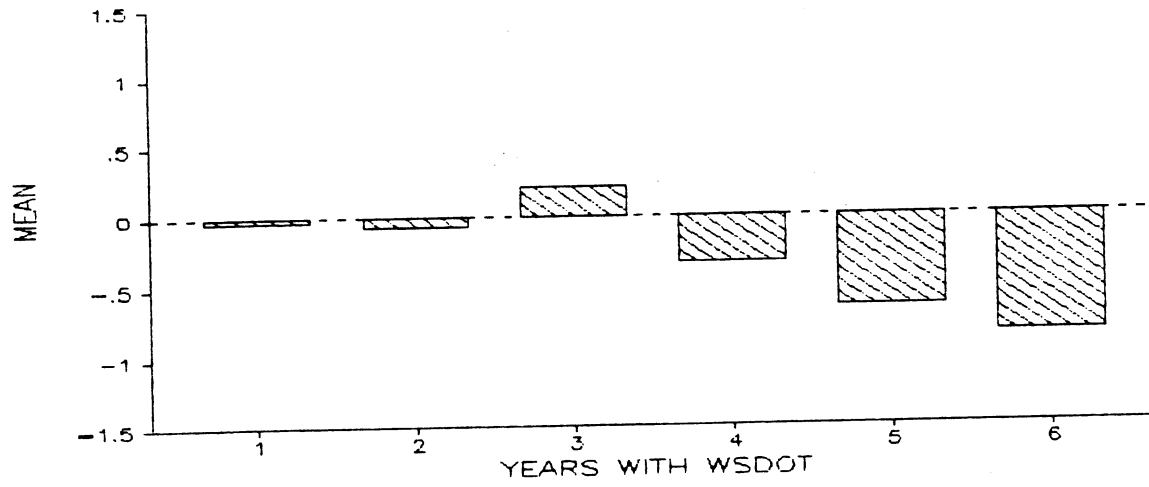
(Score range for Factor 3: -2.948 to 3.402)

Education:

As mentioned earlier, the employees with higher degrees had the lowest job satisfaction. The differences in Table 18 and Figure 18 are quite substantial, suggesting that those who are still working for their postgraduate degrees (perhaps the most ambitious, or those still hoping to move up), see the organization

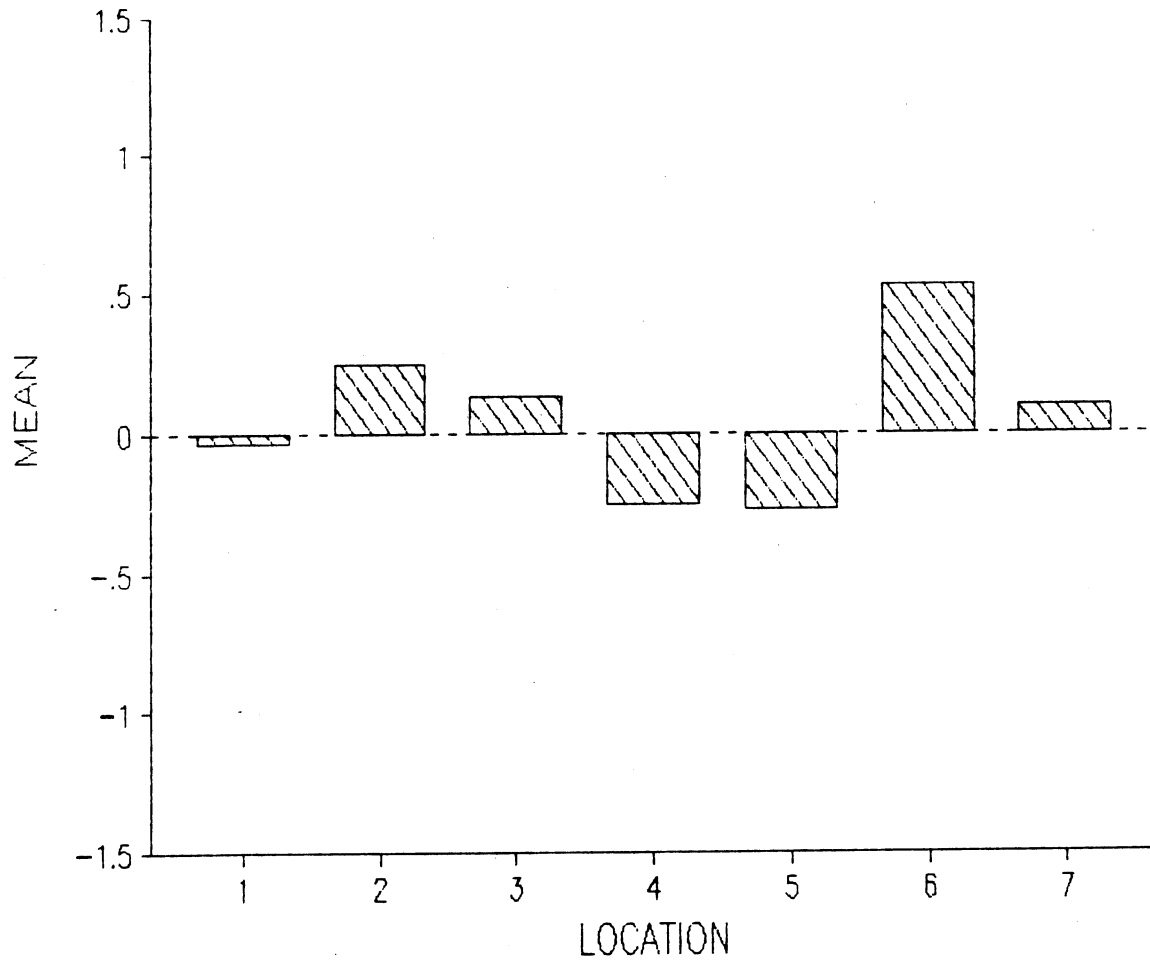


FIGURE 16  
SATISFACTION WITH PERSONNEL PRACTICES (TE2'S)



- 1 1 TO 5 YEARS
- 2 6 TO 10 YEARS
- 3 11 TO 15 YEARS
- 4 16 TO 20 YEARS
- 5 21 TO 25 YEARS
- 6 26 YEARS AND OVER

FIGURE 17  
SATISFACTION WITH PERSONNEL PRACTICES



- 1 DISTRICT 1
- 2 DISTRICT 2
- 3 DISTRICT 3
- 4 DISTRICT 4
- 5 DISTRICT 5
- 6 DISTRICT 6
- 7 HEADQUARTERS

as a dead-end street. Examining the differences in satisfaction with personnel practices by educational major shows that for employees with some postgraduate work, those with civil engineering majors report a mean satisfaction with personnel practices of  $-.281$  ( $n=20$ ), while engineers with majors in areas other than civil engineering ( $n=17$ ) have a mean of  $-.620$ . This is a significant difference and suggests that the level of satisfaction with personnel practices for employees reporting a postgraduate degree does not differ by educational major. The results for employees with some graduate work suggest that those most dissatisfied with personnel policies have education in areas other than engineering and their dissatisfaction may derive from their inability to utilize their education.

TABLE 18  
Satisfaction with personnel practices

Education Level	Mean	Std.Dev.	Cases	Approximate Raw Scores
High School Graduate	.121	1.154	78	3.708
Some College	-.061	.944	229	3.885
Associate Degree	.045	1.071	128	3.748
Bachelor's Degree	.106	.875	192	3.726
Some Postgraduate Work	-.539	1.042	37	4.558
Postgraduate Degree	-.154	1.179	26	4.141

$F=3.22, p=.007$

Type of work:

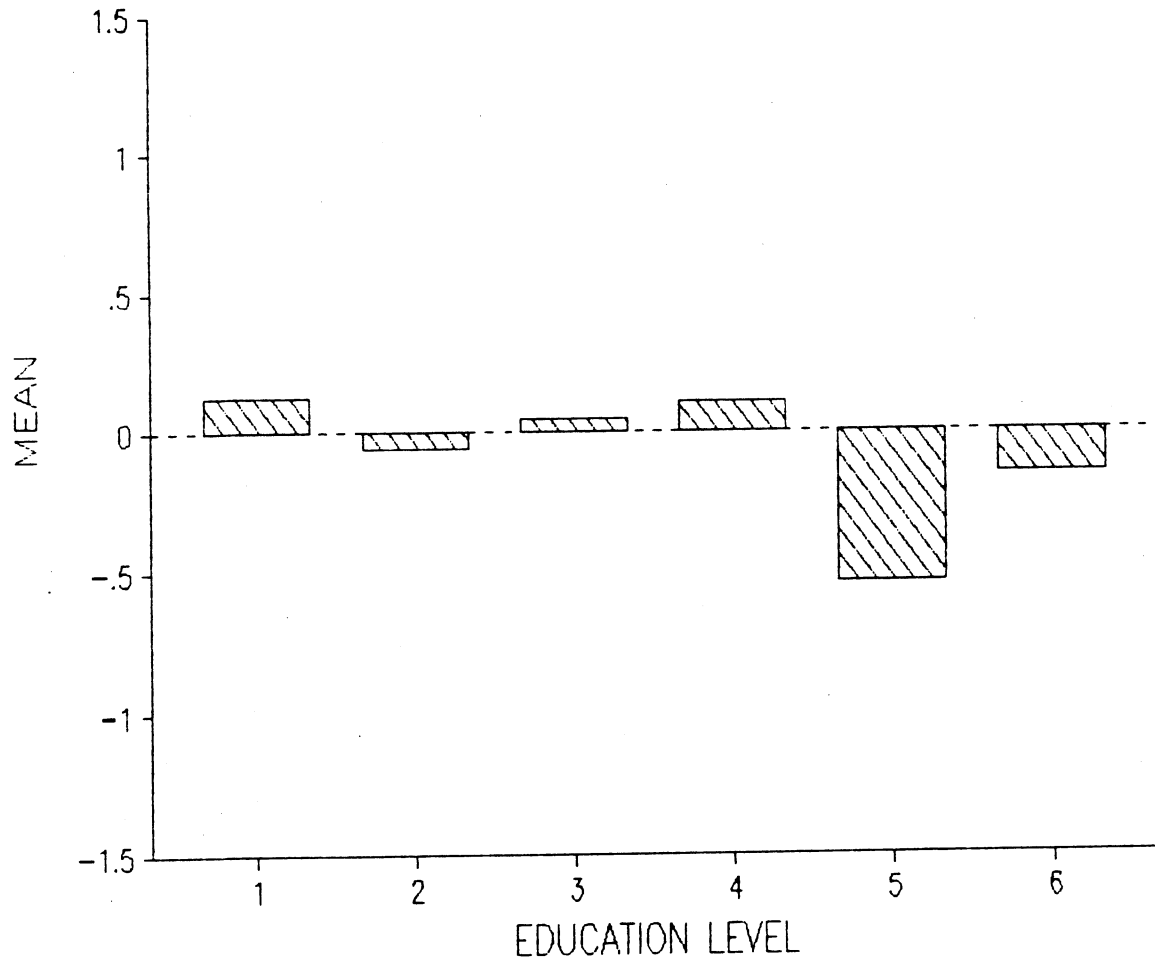
It is interesting that employees in Management Services, had very low overall satisfaction and low satisfaction with supervision. (See Table 19 and Figure 19.) Yet these same employees were most satisfied with personnel practices. On closer examination this finding can be explained by noting the high satisfaction with the organization by employees at Headquarters (Mean=.942) relative to the employees in District 1 (Mean=-.334).

TABLE 19  
Satisfaction with personnel practices

Type of Work	Mean	Std. Dev.	Cases	Approximate Raw Scores
Construction	.079	.991	306	3.801
Plans/Design	-.043	.986	232	3.782
Management Service	.413	.922	12	3.556
Materials & Testing	.250	.934	39	3.667
Transportation				
Planning	-.330	1.200	6	4.222
Traffic Engineering	-.185	1.033	32	4.067
Other	-.328	1.023	58	4.177

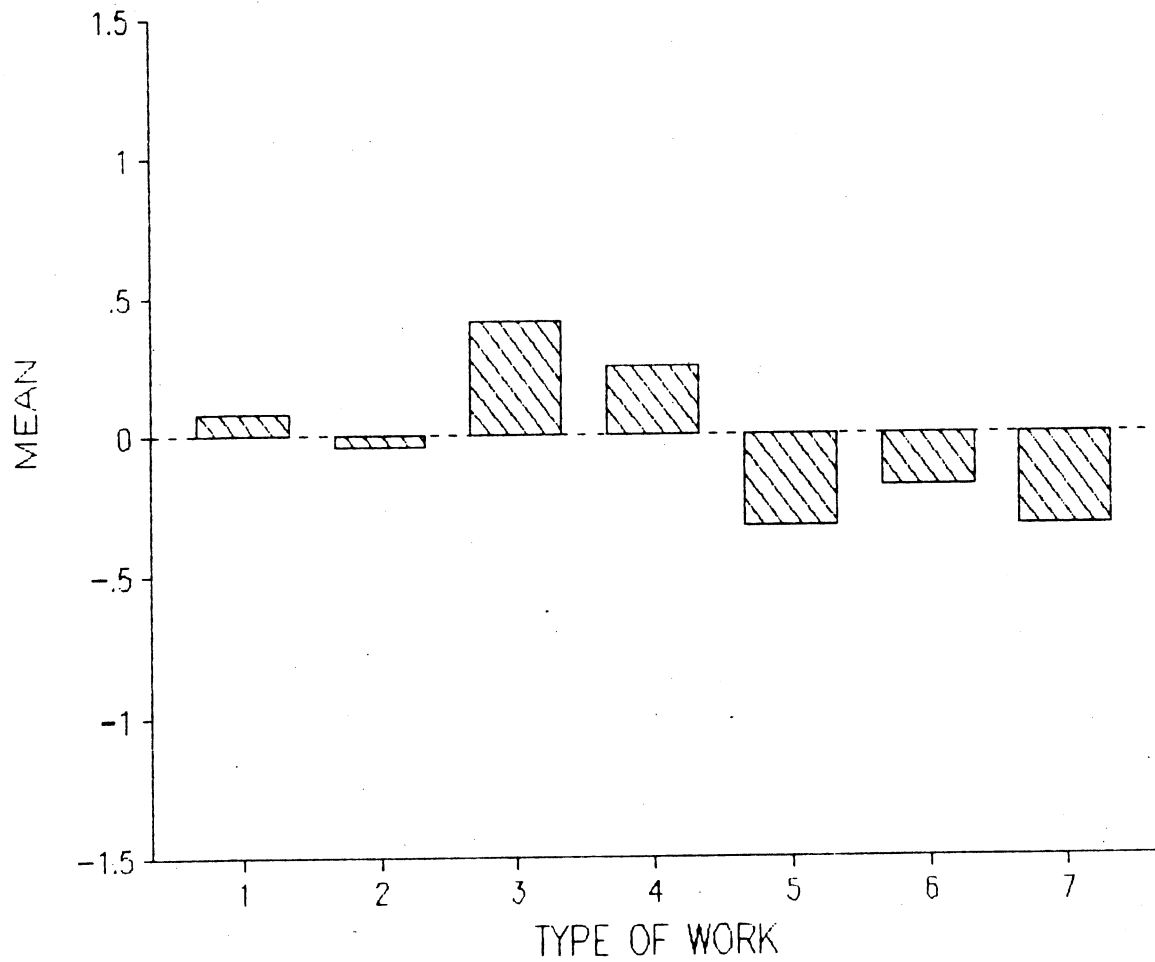
$F=2.51, p=.021$

FIGURE 18  
SATISFACTION WITH PERSONNEL PRACTICES



- 1 HIGH SCHOOL GRADUATE
- 2 SOME COLLEGE
- 3 ASSOCIATE DEGREE
- 4 BACHELOR'S DEGREE
- 5 SOME POST GRADUATE WORK
- 6 POST GRADUATE DEGREE

FIGURE 19  
SATISFACTION WITH PERSONNEL PRACTICES



- 1 CONSTRUCTION
- 2 PLANS/DESIGN
- 3 MANAGEMENT SERVICE
- 4 MATERIALS & TESTING
- 5 TRANSPORTATION PLANNING
- 6 TRAFFIC ENGINEERING
- 7 OTHER

Tenure:

The longer an employee has been with DOT the greater is the satisfaction with personnel practices. (See Table 20 and Figure 20.) For example, Item 10 states "I feel many opportunities for advancement within the organization". Employees just beginning their career with the department see more opportunities than do older employees.

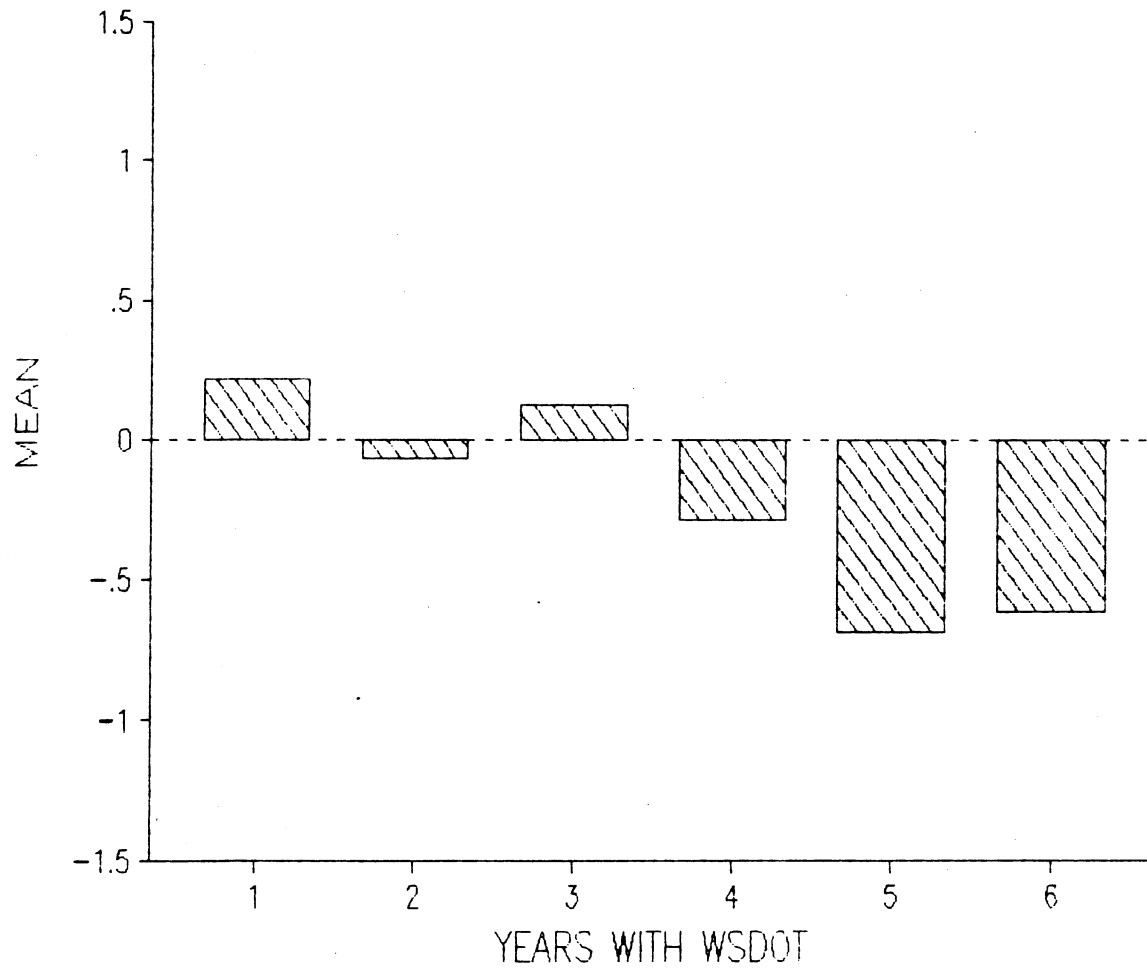
TABLE 20

Satisfaction with personnel practices

Years with DOT	Mean	Std. Dev.	Cases	Approximate Raw Scores
1 to 5 years	.219	.961	301	3.584
6 to 10 years	-.064	.965	210	4.003
11 to 15 years	.127	.899	31	3.563
16 to 20 years	-.285	.957	83	4.066
21 to 25 years	-.686	1.021	39	4.650
26 years and over	-.610	1.380	8	4.333

F=7.01, p=.000

FIGURE 20  
SATISFACTION WITH PERSONNEL PRACTICES



- 1 1 TO 5 YEARS
- 2 6 TO 10 YEARS
- 3 11 TO 15 YEARS
- 4 16 TO 20 YEARS
- 5 21 TO 25 YEARS
- 6 26 YEARS AND OVER

**Factor 4-Satisfaction with Work Environment**

- Item 13 I can work well with my co-workers.
- Item 14 For the most part, I know how well I am doing my job.
- Item 21 I am satisfied with the physical working conditions of my job.

Factor 4 is interpreted to be a measure of satisfaction with the physical and social work environment. The average raw score for the items making up Factor 4 was a 2.389 as indicated on the scale below.

:-----:	: X :	:-----:
1	2	3
Definitely true	Moder. true	Slightly true
		4
		Neither true
		5
		Slight untrue
		6
		Moder. untrue
		7
		Definitely untrue
		nor untrue

Education:

Again, as found earlier, employees with more education report lower satisfaction. (See Table 21 and Figure 21. ) For satisfaction with the work environment, however, there is a slight difference. Employees with only some postgraduate education reported the lowest level of satisfaction, whereas those with a postgraduate degree reported an average level of satisfaction. This suggests that employees with only some postgraduate education feel limited and possibly frustrated by not having their "union card" while knowing as much as their colleagues who have the degree. The engineers with some postgraduate education in engineering reported more dissatisfaction (Mean=-.738, n=20) than those with education in another area (Mean=-.453, n=17). Although the difference is small, it suggests that those with formal training in engineering are feeling least satisfied. Those who had completed a degree were relatively satisfied regardless of their field of speciality.

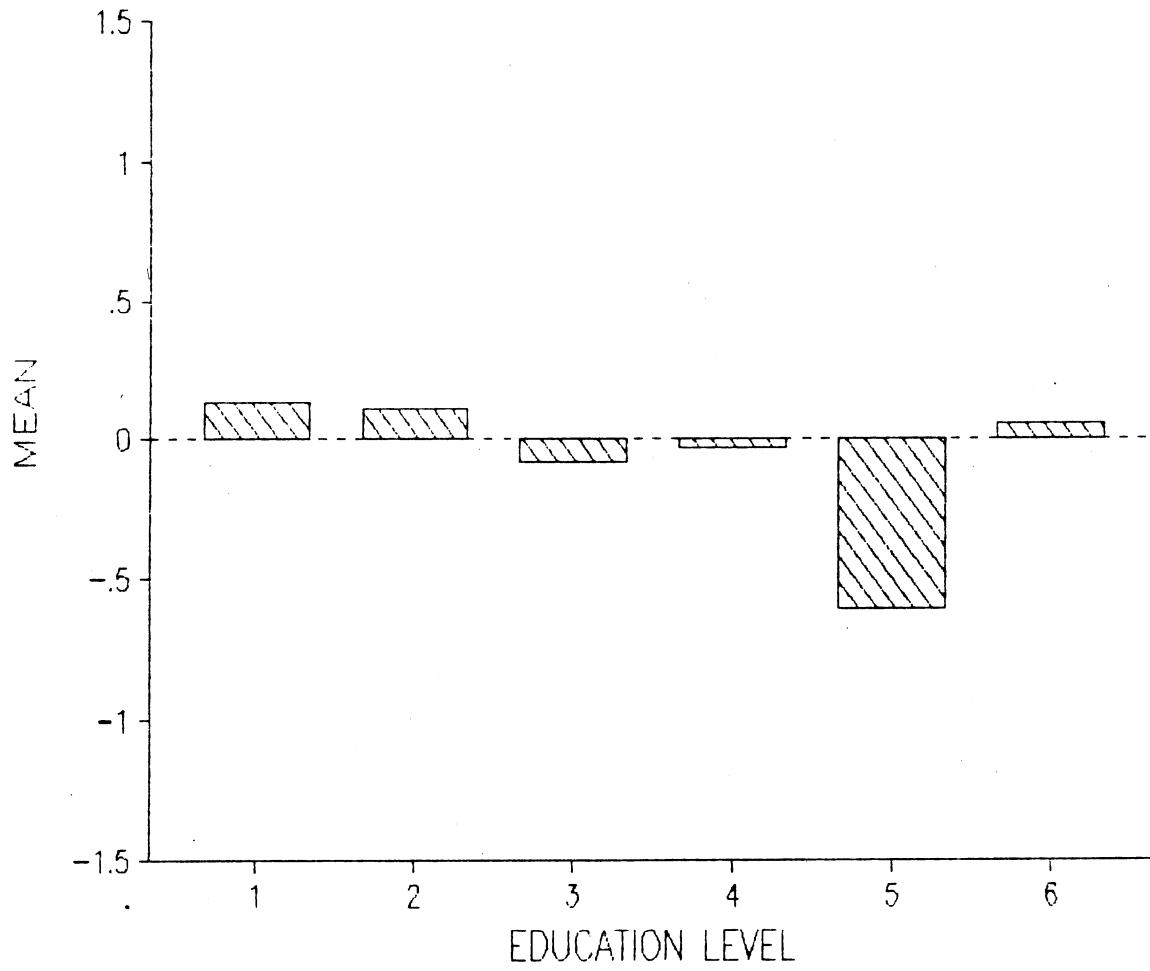
TABLE 21  
Satisfaction with work environment

Education Level	Mean	Std.Dev.	Cases	Approximate Raw Scores
High School Graduate	.138	.992	78	2.203
Some College	.108	.983	229	2.255
Associate Degree	-.087	1.000	128	2.439
Bachelor's Degree	-.033	1.007	192	2.463
Some Postgraduate Work	-.606	.967	37	3.128
Postgraduate Degree	.052	.933	26	2.457

F=3.86, p=.002



FIGURE 21  
SATISFACTION WITH WORK ENVIRONMENT



- 1 HIGH SCHOOL GRADUATE
- 2 SOME COLLEGE
- 3 ASSOCIATE DEGREE
- 4 BACHELOR'S DEGREE
- 5 SOME POST GRADUATE WORK
- 6 POST GRADUATE DEGREE

On closer examination, 46% of the 37 employees with some postgraduate work reported that they do not know when they will leave WSDOT. This was also the response of 50% of the 26 employees with a postgraduate degree who said they were unsure also. The only striking difference in frequencies was that 21.6% of the employees with some postgraduate education said that they would stay until retirement while only 7.7% of the employees with a postgraduate degree said so. Those with only some postgraduate education may report low satisfaction with their work environment because they feel limited by not having a degree and plan to stay because they have few other employment opportunities. Employees with a degree may realize they have the education that would allow them to seek employment elsewhere, and this sense of control may provide greater satisfaction.

Type of Work:

Employees in Transportation Planning and those categorizing their type of work as "Other" report below average levels of satisfaction. (See Table 22 and Figure 22.) To explain these findings, it will be necessary to find out what constitutes "Other". If "Other" represents a combination of types of work, this may present a problem. Employees who find themselves working in a couple of different areas may feel more pressure and therefore less satisfaction.

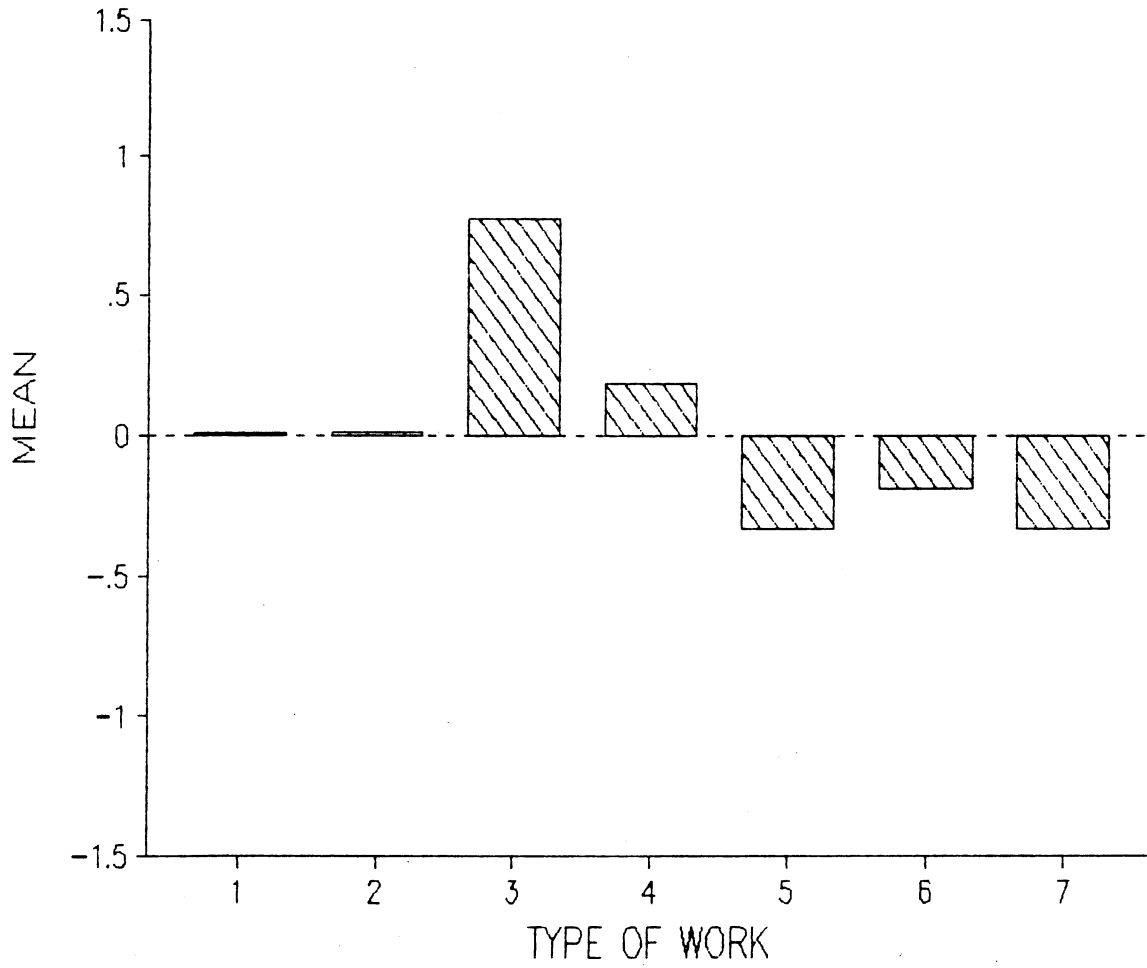
TABLE 22

Satisfaction with Work Environment by Type of Work

Type of Work	Mean	Std. Dev.	Cases	Approximate Raw Score
Construction	.011	1.077	306	2.380
Plans/Design	.014	.909	232	2.381
Management Service	.773	.615	12	1.833
Materials & Testing	.182	.832	39	2.217
Transportation Planning	-.330	1.200	6	3.167
Traffic Engineering	-.185	1.033	32	2.514
Other	-.328	1.023	58	2.608

F=2.95, p=.008

FIGURE 22  
SATISFACTION WITH WORK ENVIRONMENT



- 1 CONSTRUCTION
- 2 PLANS/DESIGN
- 3 MANAGEMENT SERVICE
- 4 MATERIALS & TESTING
- 5 TRANSPORTATION PLANNING
- 6 TRAFFIC ENGINEERING
- 7 OTHER

**Factor 5-Satisfaction with Equity of Work Conditions**

- Item 16 I find my workload is not too heavy.
- Item 17 There is not much friction among my co-workers.
- Item 20 Many people in DOT hold jobs for which they are not qualified.

Factor 5 is interpreted as satisfaction with workload and coworkers. Workload satisfaction includes a sense of equity of work distribution for the worker compared to fellow workers. The average raw score for the items making up Factor 5 was a 3.424 as indicated on the scale below.

:-----:	:-----:	:-----:	X	:-----:	:-----:	:-----:	:-----:
1	2	3	4	5	6	7	
Definitely true	Moder. true	Slightly true	Neither true nor untrue	Slight untrue	Moder. untrue	Definitely untrue	

Type of Work:

Employees working in different areas of work reported varying levels of satisfaction for Factor 5. (See Table 23 and Figure 23.) Employees in transportation planning are by far the least satisfied with their work load while employees in management services are most satisfied.

TABLE 23  
Satisfaction with Equity of Work Conditions

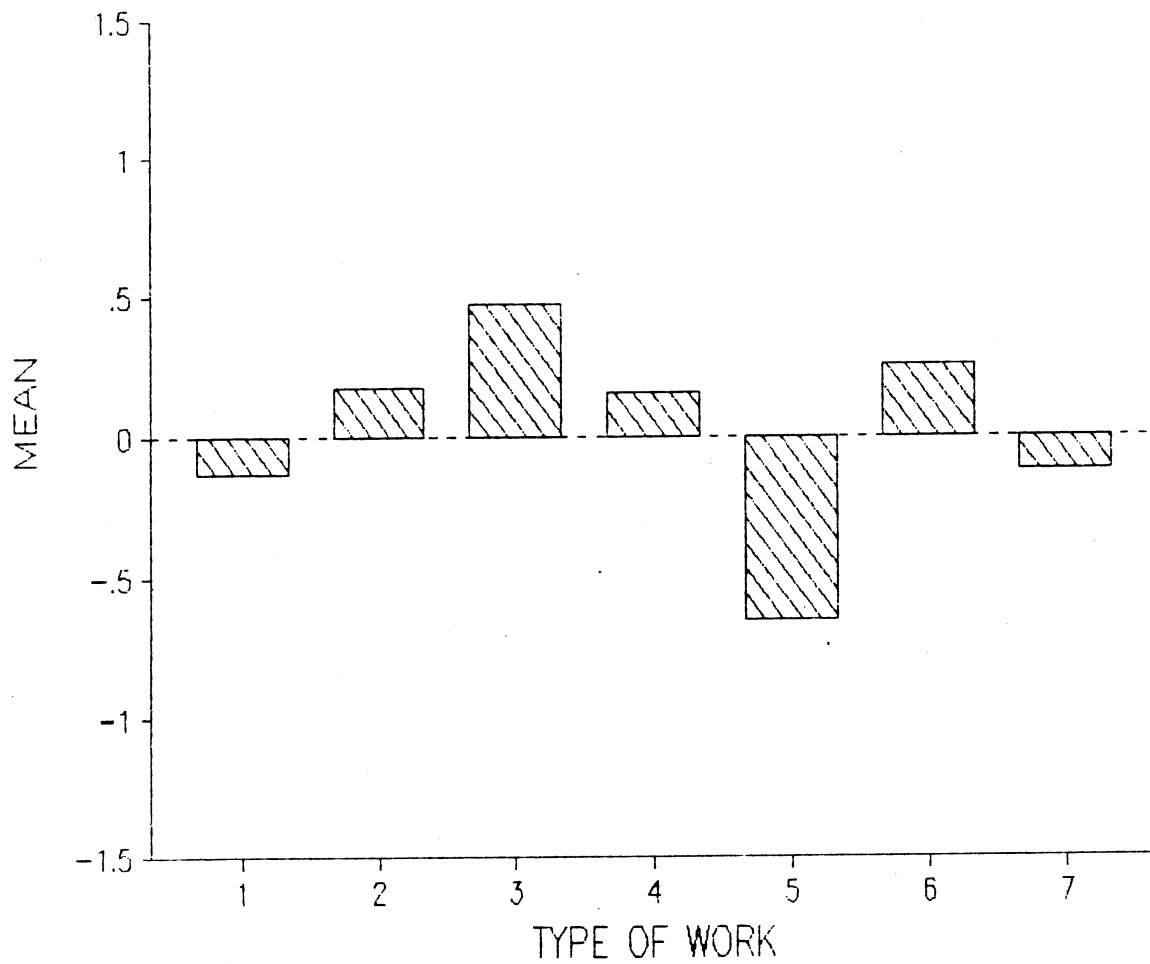
	Mean	Std. Dev.	Cases	Approximate Raw Scores
Construction	-.131	.991	306	3.478
Plans/Design	.174	.934	232	3.307
Management Service	.470	1.165	12	2.583
Materials & Testing	.156	1.138	39	3.292
Transportation Planning	-.651	.783	6	4.444
Traffic Engineering	.255	.884	32	3.422
Other	-.118	1.093	58	3.650

F=3.63, p=.001  
(Score Range for Factor 5: -3.127 to 3.039)

Tenure:

Employees who have been with WSDOT relatively longer report lower satisfaction with the equity of their workload and satisfaction with co-workers. (See Table 24 and Figure 24.) To pinpoint the exact reason for this low level of satisfaction,

FIGURE 23  
SATISFACTION WITH EQUITY OF WORK CONDITIONS



- 1 CONSTRUCTION
- 2 PLANS/DESIGN
- 3 MANAGEMENT SERVICE
- 4 MATERIALS & TESTING
- 5 TRANSPORTATION PLANNING
- 6 TRAFFIC ENGINEERING
- 7 OTHER

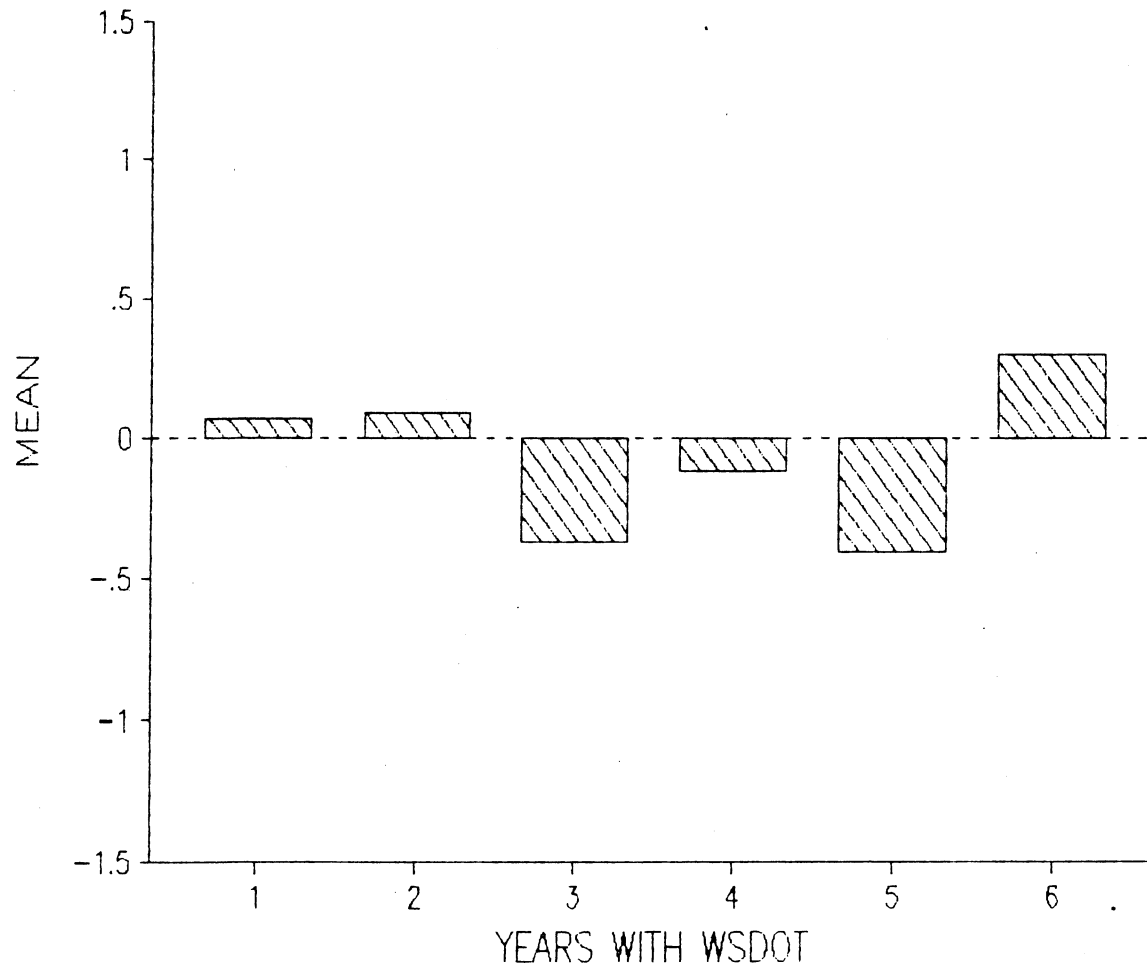
each question making up this factor was examined individually for employees who have been with WSDOT for over 10 years. Until they have worked over 25 years, employees report a heavier work load compared to those with under 10 years. The friction among co-workers also increases slightly. Both friction among co-workers and heavy workload may be a result of increasing responsibility levels for more senior employees. For employees who have been with the department under 10 years, the above average satisfaction is encouraging. If they were dissatisfied, the resulting turnover may be a more serious issue.

TABLE 24  
Satisfaction with Equity of Work Conditions

Years with DOT	Mean	Std. Dev.	Cases	Approximate Raw Scores
1 to 5 years	.072	1.014	301	3.333
6 to 10 years	.091	.970	210	3.434
11 to 15 years	-.369	1.079	31	3.583
16 to 20 years	-.116	.944	83	3.523
21 to 25 years	-.404	.890	39	3.867
26 years and over	.303	1.095	8	3.095

F=2.36, p=.02

FIGURE 24  
SATISFACTION WITH EQUITY OF WORK CONDITIONS



- 1 1 TO 5 YEARS
- 2 6 TO 10 YEARS
- 3 11 TO 15 YEARS
- 4 16 TO 20 YEARS
- 5 21 TO 25 YEARS
- 6 26 YEARS AND OVER

### Factor 6-- Involvement in the Department

- Item 8 I do not feel my knowledge and skills are underutilized in my current job assignment.
- Item 9 I know enough about the departmental policies, objectives, and goals.

Factor 6 is interpreted to indicate satisfaction with the employee's level of involvement with the department. The average raw score for the items making up Factor 6 was a 4.753 as indicated on the scale below.

:	:	:	:	X	:	:	:
-----							
1	2	3	4	5	6	7	
Definitely true	Moder. true	Slightly true	Neither true nor untrue	Slight untrue	Moder. untrue	Definitely untrue	

#### Position:

Employees at the TE1 level report the lowest level of involvement with the organization. (See Table 25 and Figure 25.) TE1s may be in a special position because of their education level and stage in their career. They may not be as involved with the department because they have just begun their careers and have many expectations associated with this first job. They may become more committed as they progress in their career.

TABLE 25

#### Involvement in the Department

	Mean	Std. Dev.	Cases	Approximate Raw Scores
TT3	-.119	.947	188	4.977
TE1	-.363	.964	70	5.147
TE2	.110	1.010	409	4.594

F=4.44, p=.002

(Score Range for Factor 6: -2.571 to 3.973)

#### Education:

Employees who attained higher levels of education report lower involvement with the department. (See Table 26 and Figure 26.) This finding can partially explain the low satisfaction score for TE1's in Table 26. The low involvement of employees with postgraduate work and postgraduate degrees may reflect their identification with their profession rather than identification with the local organization. There was no difference in level of involvement by educational major for employees with some postgraduate work or post graduate degree.



FIGURE 25  
INVOLVEMENT IN THE DEPARTMENT

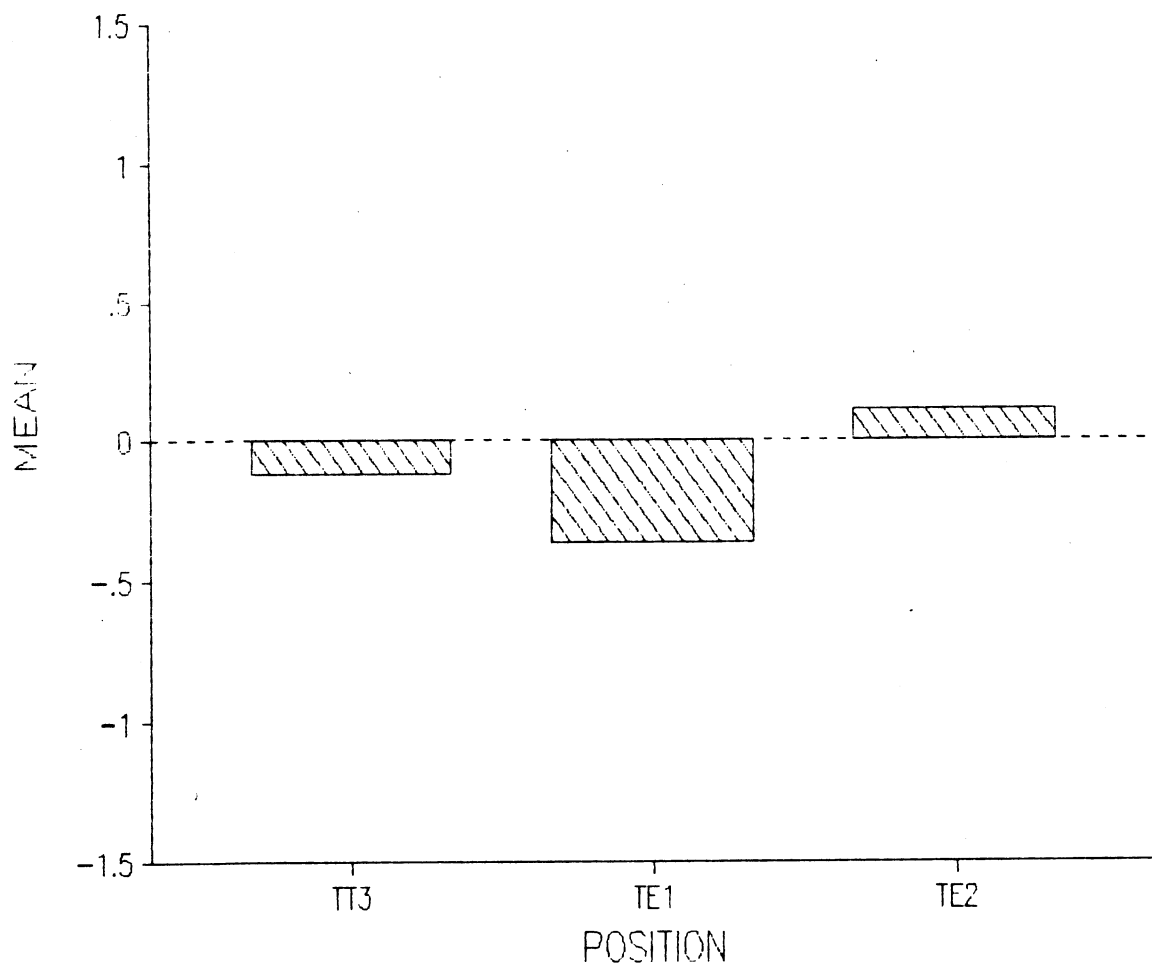


TABLE 26

## Involvement in the Department

Education Level	Mean	Std.Dev.	Cases	Approximate Raw Scores
High School Graduate	.239	1.004	78	4.555
Some College	-.009	.994	229	4.716
Associate Degree	.065	.928	128	4.664
Bachelor's Degree	-.004	.996	192	4.771
Some Postgraduate Work	-.372	1.119	37	5.088
Postgraduate Degree	-.486	.892	26	5.611

F=3.35, p=.005

Age:

Those under age 25 reported the lowest level of satisfaction. (See Table 27 and Figure 27.) It is expected that younger employees would be less involved with the organization because they have less invested in their job than do older employees. Steps might well be in order to increase the involvement of younger employees with their organization. Such methods as including them in planning and decision-making, bringing them into socially cohesive units, etc. would contribute to a feeling of belonging.

TABLE 27

## Involvement in the Department

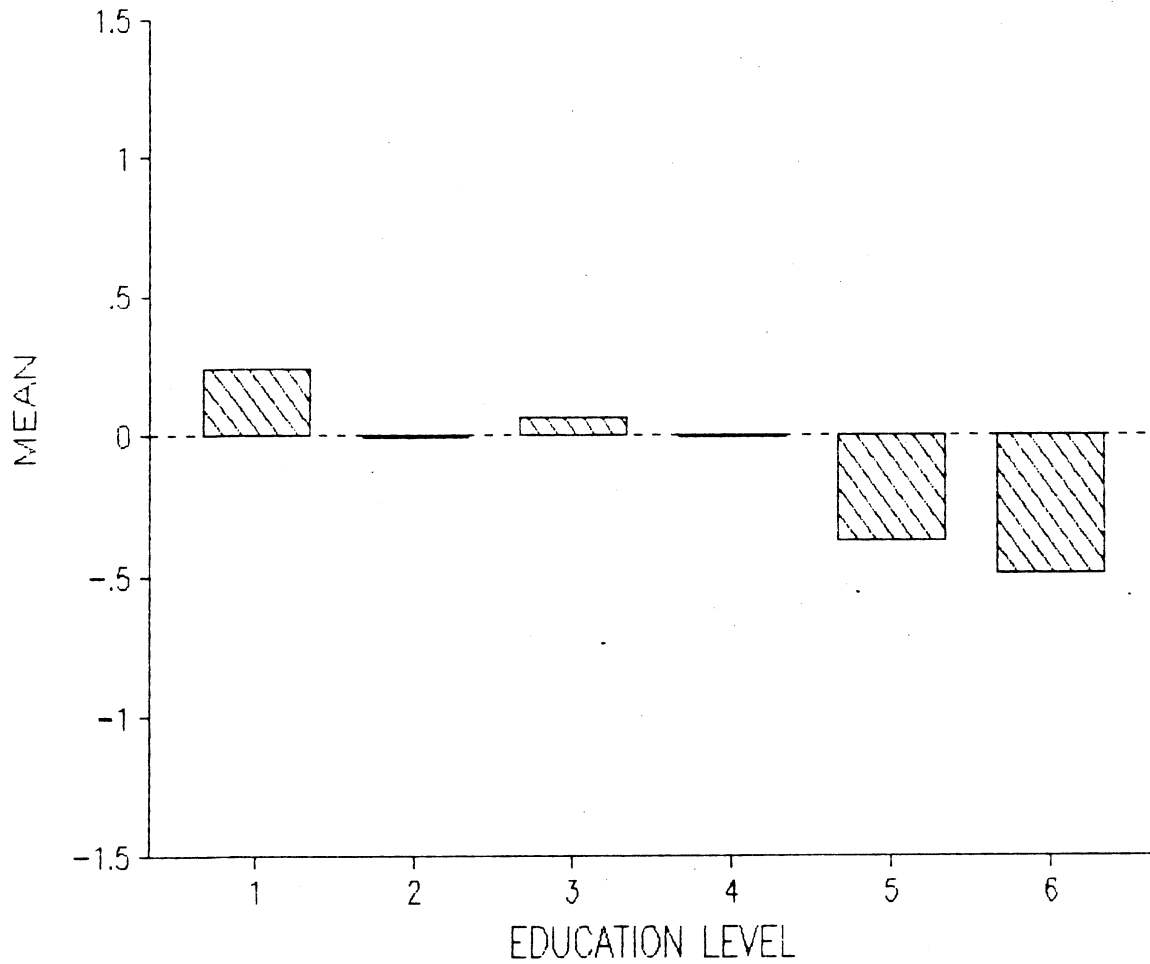
Age	Mean	Std. Dev.	Cases	Approximate Raw Scores
25 and under	-.455	.717	40	5.091
26-39	-.041	1.008	406	4.772
40-54	.154	.952	188	4.659
55 and over	.110	1.150	48	4.760

F= 4.77, p=.003

Tenure:

Employees working with WSDOT for less than 5 years report uniformly low involvement. (See Table 28 and Figure 28.) New employees may not yet feel that they are part of the "team". As employees progress they either may leave, or else stay on because they feel more involved with their jobs. Employee involvement seems to peak around 11 to 15 years and then drops off slightly as the employee remains in the organization.

FIGURE 26  
INVOLVEMENT IN THE DEPARTMENT



- 1 HIGH SCHOOL GRADUATE
- 2 SOME COLLEGE
- 3 ASSOCIATE DEGREE
- 4 BACHELOR'S DEGREE
- 5 SOME POST GRADUATE WORK
- 6 POST GRADUATE DEGREE

FIGURE 27  
INVOLVEMENT IN THE DEPARTMENT

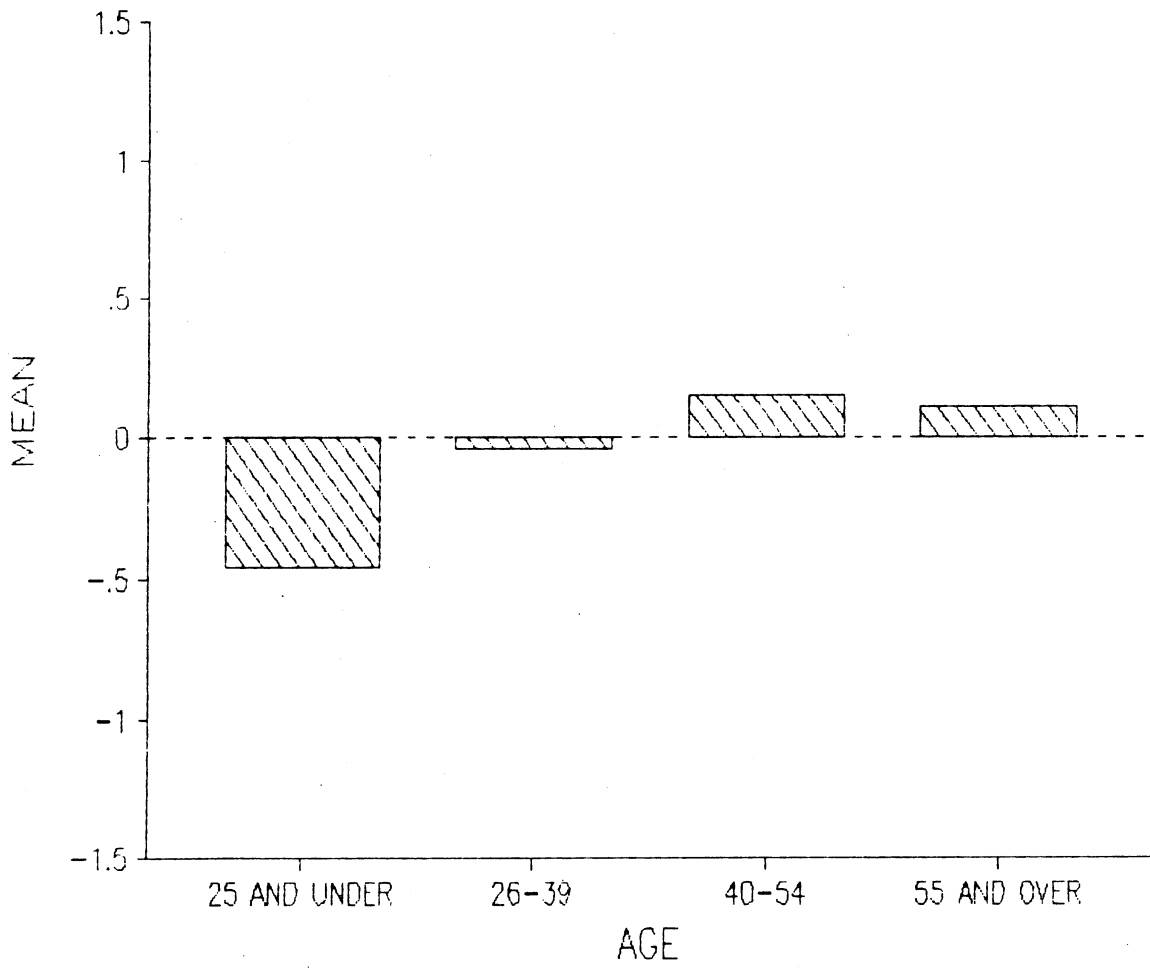


TABLE 28

## Involvement in the Department

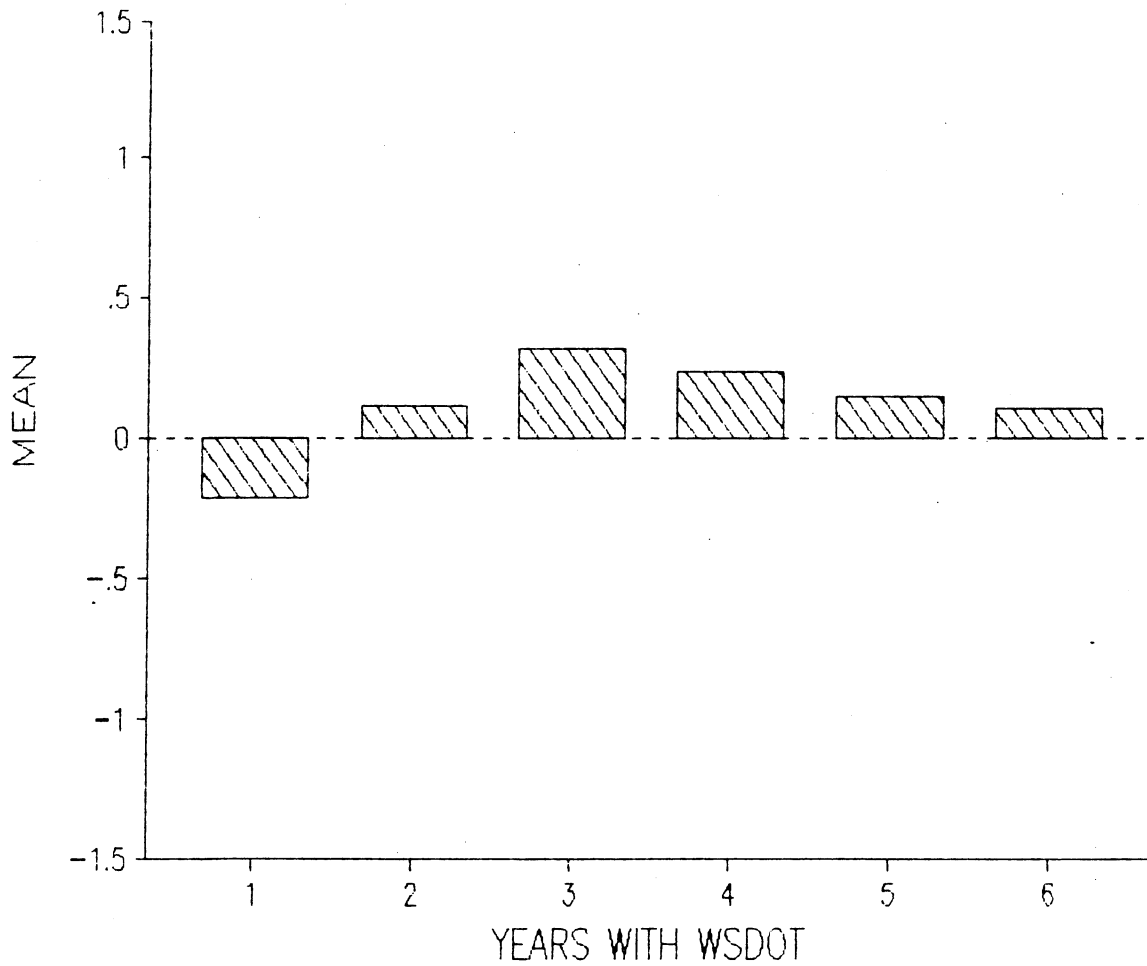
---

Years with DOT	Mean	Std. Dev.	Cases	Approximate Raw Scores
1 to 5 years	-.212	.938	301	5.035
6 to 10 years	.113	.969	210	4.615
11 to 15 years	.319	1.079	31	4.313
16 to 20 years	.238	.944	83	4.390
21 to 25 years	.150	.890	39	4.638
26 years and over	.104	1.049	8	4.643

---

F=3.77, p=.00

FIGURE 28  
INVOLVEMENT IN THE DEPARTMENT



- 1 1 TO 5 YEARS
- 2 6 TO 10 YEARS
- 3 11 TO 15 YEARS
- 4 16 TO 20 YEARS
- 5 21 TO 25 YEARS
- 6 26 YEARS AND OVER

## INDIVIDUAL QUESTIONNAIRE RESPONSES

### Most important reason for leaving

Question 22: Employees were asked to choose the most important and second most important potential reasons for leaving WSDOT. The distribution of answers for all employees is as follows:

TABLE 29

REASON	Most Important	Second Important
Low Salary	38.7%	20.8%
No sense of personal accomplishment	23.8%	16.7%
Poor promotional opportunities	17.3%	30.1%
Availability of a comparable job in a private firm	9.3%	17.5%
No respect from the people with whom I work	7.6%	8.3%
Inadequate training	3.2%	6.5%

We examined the relationship between each factor and the most important reason for leaving. (See Table 30.) For example, employees who selected as their most important reason for leaving "No sense of personal accomplishment" had a mean satisfaction level of  $-.202$ . Whereas those employees to whom "low salary" was the most important reason for leaving, reported a slightly above average level of overall satisfaction. Many of the results in Table 30 are not unexpected.

TABLE 30

Most Important Reason for Leaving by each Factor Score

Factor	1	2	3	4	5	6
Low Salary	.193	.160	.001	.105	-.059	.052
No sense of personal Accomplishment	-.202	-.054	.087	-.131	.078	-.008
Poor Promotional Opportunities	-.103	-.019	-.351	-.097	-.027	-.125
Comparable Job in Private Firm	.026	.004	.135	.119	-.081	-.141
No Respect from co-workers	-.066	-.522	.027	-.004	.150	.217
Inadequate Training	-.285	-.264	.286	-.016	-.049	-.451

Regardless of their satisfaction, many employees reported that low salary would induce them to leave. This suggests that improvements in employee's work environment and general satisfaction will not counteract the lack of competitive salaries. In examining the relationship of overall satisfaction with each reason for leaving, we see that some distinctions can be made between satisfied and dissatisfied employees. Those employees who name low salary as the most important reason report average satisfaction.

Employees whose reason for leaving would be "felt lack of personal accomplishment" reported low general satisfaction and low satisfaction with the work environment. Moreover the data suggest that an unpleasant work environment could lead to turnover if the employee felt a lack of personal accomplishment.

Employees reporting a low level of satisfaction with personnel practices also mentioned "poor promotional opportunities" as the most important reason for leaving WSDOT. It is interesting that is the relatively low general satisfaction and lack of involvement are associated with this reason for leaving. Only the employees who feel a lack of involvement reported that a comparable job in a private firm would make them want to leave WSDOT. Thus, the appeal of private sector jobs could be reduced if the employee felt more involved with the organization.

Employees with low general satisfaction, low satisfaction with supervision, and low involvement chose inadequate training as the most important reason for wanting to leave their jobs. At face value, these results suggest that more emphasis on training may result in increased satisfaction with supervision and involvement with the organization.

Most Important Reason for Leaving By district:

TABLE 31

District	1	2	3	4	5	6	Head- quarters
	n=276	n=35	n=135	n=80	n=76	n=35	n=47
Low Salary	51.2	33.3	30.0	28.0	39.0	17.5	27.1
No sense of personal Accomplishment	21.6	22.2	27.9	28.0	19.5	32.5	25.0
Poor Promotional Opportunities	11.3	19.4	14.3	29.3	18.2	27.5	25.0
Comparable Job in Private Firm	8.1	5.6	10.7	4.9	14.3	12.5	12.5
No Respect from co-workers	6.0	8.3	11.4	7.3	7.8	7.5	8.3
Inadequate Training	1.8	11.1	5.7	2.4	1.3	2.5	2.1

-----  
(Numbers expressed in percentages)



Employees in District 1 seem most concerned with low salary, whereas those in District 6 are least concerned. (See Table 31.) This no doubt reflects the higher cost of living in the Seattle area. District 6 employees are more concerned with perceived lack of personal accomplishment. Since these employees are also concerned with low personal accomplishment it suggests that these employees may not be sufficiently aware how their work fits into the larger task of the organization.

Employees in Districts 4 and 6 seem somewhat more concerned about promotional opportunities than do those in other districts. Employees in Districts 5 and 6, and Headquarters seem to consider comparable jobs in private firms as alternative employment. It appears that those from District 2 might leave more readily than those from other districts if they had inadequate training.

Most Important Reason for Leaving By Classification:

TABLE 32

Position	TT3 n=187	TE1 n=82	TE2 n=419
Low Salary	32.6	30.5	42.2
No sense of personal Accomplishment	26.7	25.6	23.4
Poor Promotional Opportunities	19.3	20.7	15.8
Comparable Job in Private Firm	8.0	14.6	8.4
No Respect from co-workers	10.2	1.2	8.1
Inadequate Training	3.2	7.3	2.1

(Numbers expressed in percentages)

The distribution of reasons why employees in the TT3, TE1, and TE2 classifications might leave are essentially similar to those found for all employees. (See Table 32 and Table 29 for comparison.) TE1s seem slightly more concerned with promotional opportunities and the idea of a comparable job in a private firm than do other employees. Also, a larger percentage of TE1s, as compared to all other employees, reported that inadequate training would make them leave. One important reason for remaining in the organization is, therefore, the training it provides. TE2s more frequently chose low salary as a reason for wanting to leave more often than did all other employees. Some TT3s (10.2%) indicated that lack of respect from co-workers would make them leave. exercised perhaps by management based on educational accomplishment.

## Employees' plans to remain with the organization

Question 23 asked employees to indicate how long they planned to stay at WSDOT. Table 33 lists the response options they were given and the percentages for all employees.

TABLE 33

Under a year	3.6%
At least 3 years	12.3%
At least 5 years	7.0%
At least 10 years	3.4%
Until retirement	44.8%
Unsure	28.8%

Approximately 45% of all employees responded that they would remain on the job until retirement. Another 28.8% were unsure of how long they would stay. To determine which employees make up the latter group, differences in how long employees would stay were examined by district, position, and type of work.

### Plans to leave by District:

Table 34 indicates that the percentages obtained by District are similar to those obtained for all employees, however, 6.6% in District 1 consider leaving in less than one year.

TABLE 34

Percent of employees by district who plan to leave WSDOT at various times

Location	1 n=276	2 n=35	3 n=135	4 n=80	5 n=76	6 n=35	Head- quarters n=47
Under a year	6.6	0	1.4	2.4	1.3	2.4	0
At least 3 years	13.9	15.8	17.6	9.4	3.8	4.9	10.2
At least 5 years	7.3	13.2	9.4	5.9	2.5	7.3	4.1
At least 10 years	3.8	0	2.8	4.7	1.3	2.4	6.1
Until Retirement	39.6	50.0	42.3	48.3	57.0	56.1	46.9
Unsure	28.8	21.1	26.8	29.4	34.2	26.8	32.7

### Plans to Leave by Classification:

The most striking findings presented in Table 35 are the percentages for the TEIs: 26.8% report they plan to leave in less than 3 years, while only 17% plan to stay until retirement. 39% are uncertain about when they will leave. For the TE2s, a greater majority (50.5%) plan to stay with WSDOT.

TABLE 35

Percent of employees by position who plan to leave  
WSDOT at various times

Classification	TT3 n=187	TE1 n=82	TE2 n=419
Under a year	2.0	4.9	4.2
At least 3 years	11.2	26.8	9.7
At least 5 years	10.2	8.5	5.7
At least 10 years	3.0	3.7	3.1
Until Retirement	44.1	17.0	50.5
Unsure	29.4	39.0	26.9

Plans to Leave by Type of Work:

TABLE 36  
Percent of employees by type of work who plan to leave  
WSDOT at various times

Type of Work	1 n=325	2 n=246	3 n=12	4 n=40	5 n=6	6 n=35	7 n=62
Under a year	4.3	3.7	0	2.5	0	0	1.6
At least 3 years	11.8	12.2	8.3	7.5	33.3	26.5	9.7
At least 5 years	6.5	6.9	8.3	12.5	0	5.9	9.7
At least 10 years	4.0	2.9	0	2.5	16.7	2.9	1.6
Until Retirement	46.8	42.1	25.0	57.5	0	35.3	51.7
Unsure	26.3	32.2	58.3	17.5	50.0	29.4	25.8

- |                        |                            |
|------------------------|----------------------------|
| 1. Construction        | 5. Transportation Planning |
| 2. Plans/Design        | 6. Traffic Engineering     |
| 3. Management Service  | 7. Other                   |
| 4. Materials & Testing |                            |

A large proportion (57.5%) of employees in Materials and Testing and in the "Other" category (51.7%) expect to stay with WSDOT until retirement. A large number of employees in Management Service (58.3%) expressed uncertainty about their plans to stay. Of concern is the relatively large percentage (26.5%) of employees in Traffic Engineering who plan to leave within 3 years. As Table 5 shows these employees in Traffic Engineering also express low satisfaction with personnel practices (Table 19) and work environment (Table 22) and suggests the reason for their plans to seek other employment.

The results from the preceding tables in this section suggest a number of possible remedies for reducing dissatisfaction. Among these are methods of job redesign, and employee development and training to increase satisfaction with specific aspects of the job as well as with supervision. We also suggest the possibility of training engineers to make more effective use of their abilities and job experience by learning to develop a favorable work environment.

Appendix A



**Washington State  
Department of Transportation**

Transportation Building KF-01  
Olympia, Washington 98504-5201  
206 753-6005

**Duane Berentson**  
Secretary of Transportation

October 17, 1986

TO: All Engineering Technicians 3, Transportation Engineers 1 and 2  
FROM: Duane Berentson, Secretary *DB*  
SUBJECT: Employee Job Satisfaction Survey

In order to develop a more satisfying and productive working environment for employees of our Department, we are interested in receiving the comments and opinions of many of our present engineering employees who represent a major segment of our employee population.

To accomplish this task, we have enlisted the assistance of Dr. Fred E. Fiedler and his staff, representing the Organizational Research Group at the University of Washington. During the past several months, Dr. Fiedler has been developing a confidential survey which will be circulated to each permanent employee in the classifications of Transportation Technician.3; and Transportation Engineer 1 and 2. Dr. Fiedler's staff will analyze this survey response and develop a report with recommendations to the management of the Department of Transportation.

Dr. Fiedler will be circulating this questionnaire from his offices and responses will be directed back to the University of Washington. I would encourage each participant in this survey to respond as quickly and as candidly to the questionnaire as possible.

DB:lb  
AJM

UNIVERSITY OF WASHINGTON  
SEATTLE, WASHINGTON 98195

Department of Psychology  
Organizational Research, NI-25

October 17, 1986

Dear Survey Participant:

Recently you were advised by Secretary Duane Berentson of the Department of Transportation's desire to identify and effectively deal with issues and conditions in your working environment which prevent full job satisfaction and productivity. The Organizational Research Group from the University of Washington has been asked by the Department of Transportation to assist in assessing the current working environment. As part of this effort, we are distributing this questionnaire to study what DOT staff think about their current positions.

Your response to this questionnaire will be kept confidential as required by law. We ask that you respond to the questions frankly and honestly. Only staff of the Organizational Research Group will see your responses. In order to ensure anonymity, do not put your name on the questionnaire. A summary of all the employees' responses will be given to the Department of Transportation, and we expect the Department to share these results with you.

Please complete and return the questionnaire through the state mail system 2 days after you receive it. You may omit any questions you prefer not to answer.

Thank you very much for your time and cooperation. We greatly appreciate your help.

Sincerely,



Dr. Fred E. Fiedler  
Organizational Research Lab  
University of Washington

Enclosures

Telephone: (206) 543-3311

The information you provide is strictly confidential. Only the staff of the Organizational Research Group will see your questionnaire. Please place a check or X above the number on each scale that best indicates your answer.

1. My current job provides me with challenging and interesting problems.

:_:_:	:_:_:	:_:_:	:_:_:	:_:_:	:_:_:	:_:_:
1	2	3	4	5	6	7
Definitely true	Moderately true	Slightly true	Neither true nor untrue	Slightly untrue	Moderately untrue	Definitely untrue

2. In my current job, I am left to do my own work most of the time.

:_:_:	:_:_:	:_:_:	:_:_:	:_:_:	:_:_:	:_:_:
1	2	3	4	5	6	7

3. For the most part, my career with the Department has been what I had expected it to be.

:_:_:	:_:_:	:_:_:	:_:_:	:_:_:	:_:_:	:_:_:
1	2	3	4	5	6	7

4. Overall, I find my work to be very satisfying.

:_:_:	:_:_:	:_:_:	:_:_:	:_:_:	:_:_:	:_:_:
1	2	3	4	5	6	7

5. I feel that I am getting the proper amount of instruction and assistance from my supervisor.

:_:_:	:_:_:	:_:_:	:_:_:	:_:_:	:_:_:	:_:_:
1	2	3	4	5	6	7

6. The interesting nature of my job does much to compensate for other possible disadvantages.

:_:_:	:_:_:	:_:_:	:_:_:	:_:_:	:_:_:	:_:_:
1	2	3	4	5	6	7

7. I feel adequately informed about the projects or programs on which I am working.

:_:_:	:_:_:	:_:_:	:_:_:	:_:_:	:_:_:	:_:_:
1	2	3	4	5	6	7

8. I feel my knowledge and skills are underutilized in my current job assignment.

:_:_:	:_:_:	:_:_:	:_:_:	:_:_:	:_:_:	:_:_:
1	2	3	4	5	6	7
Definitely true	Moderately true	Slightly true	Neither true nor untrue	Slightly untrue	Moderately untrue	Definitely untrue



9. I wish I knew more about the departmental policies, objectives, and goals.

:___:	:___:	:___:	:___:	:___:	:___:	:___:
1	2	3	4	5	6	7
Definitely true	Moderately true	Slightly true	Neither true nor untrue	Slightly untrue	Moderately untrue	Definitely untrue

10. The opportunities for advancement within this organization are very good.

:___:	:___:	:___:	:___:	:___:	:___:	:___:
1	2	3	4	5	6	7

11. I feel a lot of pride as an employee of the Department of Transportation.

:___:	:___:	:___:	:___:	:___:	:___:	:___:
1	2	3	4	5	6	7

12. I enjoy the level of responsibility I am given in my job.

:___:	:___:	:___:	:___:	:___:	:___:	:___:
1	2	3	4	5	6	7

13. I can work well with my co-workers.

:___:	:___:	:___:	:___:	:___:	:___:	:___:
1	2	3	4	5	6	7

14. For the most part, I know how well I am doing my job.

:___:	:___:	:___:	:___:	:___:	:___:	:___:
1	2	3	4	5	6	7

15. I feel my supervisor supports and helps me in my work.

:___:	:___:	:___:	:___:	:___:	:___:	:___:
1	2	3	4	5	6	7

16. I find my workload is too heavy.

:___:	:___:	:___:	:___:	:___:	:___:	:___:
1	2	3	4	5	6	7

17. There is much friction among my co-workers.

:___:	:___:	:___:	:___:	:___:	:___:	:___:
1	2	3	4	5	6	7
Definitely true	Moderately true	Slightly true	Neither true nor untrue	Slightly untrue	Moderately untrue	Definitely untrue

18. I consider my supervisor to be well qualified for his job.

:___:	:___:	:___:	:___:	:___:	:___:	:___:
1	2	3	4	5	6	7
Definitely true	Moderately true	Slightly true	Neither true nor untrue	Slightly untrue	Moderately untrue	Definitely untrue

19. I am satisfied with the promotion testing procedure at DOT.

:___:	:___:	:___:	:___:	:___:	:___:	:___:
1	2	3	4	5	6	7

20. Many people in DOT hold jobs for which they are not qualified.

:___:	:___:	:___:	:___:	:___:	:___:	:___:
1	2	3	4	5	6	7

21. I am satisfied with the physical working conditions of my job.

:___:	:___:	:___:	:___:	:___:	:___:	:___:
1	2	3	4	5	6	7

For the following questions, please put a check or "X" in the space beside your answer.

22. Below are a list of factors that might make a person leave the WSDOT. Please put a "1" next to the factor that would be most important to you as a reason for leaving WSDOT. Put a "2" beside the factor that is the second most important factor.

- \_\_\_ 1. poor promotional opportunities
- \_\_\_ 2. low salary
- \_\_\_ 3. inadequate training
- \_\_\_ 4. availability of a comparable job in a private firm
- \_\_\_ 5. no sense of personal accomplishment
- \_\_\_ 6. no respect from the people with whom I work

23. How much longer will you stay with DOT?

- \_\_\_ 1. under a year
- \_\_\_ 2. for at least the next three years
- \_\_\_ 3. for at least the next five years
- \_\_\_ 4. for at least the next ten years
- \_\_\_ 5. until retirement
- \_\_\_ 6. unsure
- \_\_\_ 7. I do not expect to leave

24. Ethnic Identification (Optional):

- \_\_\_ 1. Caucasian/White
- \_\_\_ 2. Afro-American/Black
- \_\_\_ 3. Hispanic/Mexican American
- \_\_\_ 4. Asian
- \_\_\_ 5. Native American/American Indian
- \_\_\_ 6. Other \_\_\_\_\_

25. Sex:

- 1. Male
- 2. Female

26. Age:

- 1. less than 25
- 2. 26-39
- 3. 40-54
- 4. 55-over

27. Please indicate the number of years you were in each position, rounded to the nearest year, and place a check in the box beside your present position.

	<u># of years</u>
<input type="checkbox"/> TT1	-----
<input type="checkbox"/> TT2	-----
<input type="checkbox"/> TT3	-----
<input type="checkbox"/> TE1	-----
<input type="checkbox"/> TE2	-----

28. Mark the location at which you presently work:

District:

- 1 -----
- 2 -----
- 3 -----
- 4 -----
- 5 -----
- 6 -----

Headquarters: -----

29. Mark the type of work to which you are assigned at the present time:

- 1. Construction
- 2. Plans/Design Development
- 3. Management Service
- 4. Materials acceptance/testing
- 5. Transportation systems planning
- 6. Traffic engineering
- 7. Other

30. Education:

- 1. High School Graduate
- 2. Some College
- 3. Associate Degree
- 4. Bachelor's Degree
- 5. Some post graduate work
- 6. Post graduate degree

31. Mark the response that describes your college major:

- 1. Civil engineering
- 2. Business/Economics
- 3. Construction Management
- 4. Transportation/Urban Planning
- 5. Other

UNIVERSITY OF WASHINGTON  
SEATTLE, WASHINGTON 98195

*Department of Psychology  
Organizational Research, NI-25*

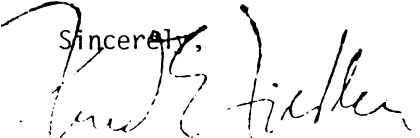
October 31, 1986

Dear Survey Participant:

Last week we sent you a questionnaire which asked that you describe how you felt about your job at the Department of Transportation, and how it might be improved. In order to help the Department in making good personnel policy decisions, it is very important that we get a representative group of employees to respond. If you have not done so already, I would like to ask you most urgently to return the questionnaire as soon as possible, either through the Washington State Mail system or through the U. S. Postal service.

If you have misplaced your questionnaire, there are extra copies available at each of the district headquarters and in the Olympia head office. Please return your completed questionnaire to the Organizational Research Group NI-25, University of Washington, Seattle, 98195. Your responses are completely confidential and will be reported only in the form of percentages and averages to the Department of Transportation. Your name will not in any way be associated with the responses. Thank you for your cooperation in advance. We hope the results of this survey will make the Department of Transportation a more satisfying place to work.

Sincerely,



Dr. Fred E. Fiedler  
Organizational Research Group  
University of Washington

*Telephone: (206) 543-2314*

Appendix B

Rotated Factor Matrix

		Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Ques. 1	<b>.821</b>	.152	.059	.025	-.100	-.002	
Ques. 2	<b>.424</b>	.297	-.180	.342	.066	-.161	
Ques. 3	<b>.599</b>	.220	.361	.229	.036	.001	
Ques. 4	<b>.814</b>	.248	.212	.170	-.004	-.042	
Ques. 5	.256	<b>.786</b>	.111	.148	.102	.015	
Ques. 6	<b>.735</b>	.125	.240	.104	.044	.013	
Ques. 7	.294	<b>.602</b>	.187	.259	.004	.136	
Ques. 8	<b>.509</b>	-.026	-.000	-.286	.179	<b>.492</b>	
Ques. 9	-.097	.112	-.065	.131	.009	<b>.858</b>	
Ques. 10	.244	.125	<b>.728</b>	.141	.050	-.028	
Ques. 11	<b>.480</b>	.162	<b>.438</b>	.175	.039	-.128	
Ques. 12	<b>.696</b>	.281	.040	.241	.037	-.004	
Ques. 13	.291	.185	-.123	<b>.470</b>	.369	-.303	
Ques. 14	.149	.317	.026	<b>.668</b>	-.052	.038	
Ques. 15	.210	<b>.830</b>	.054	.203	.060	.011	
Ques. 16	-.190	-.138	.018	.144	<b>.621</b>	.044	
Ques. 17	.180	.254	.038	.012	<b>.689</b>	-.023	
Ques. 18	.117	<b>.803</b>	.087	-.115	.071	.004	
Ques. 19	.097	.065	<b>.771</b>	-.047	.048	-.007	
Ques. 20	.013	.202	.312	-.301	<b>.448</b>	.119	
Ques. 21	.231	-.038	.268	<b>.617</b>	.117	.143	

\*Questions indicated in bold type were used to interpret factors