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STAFFING PLAN SURVEY OF STATE TRANSPORTATION AGENCIES

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ABSTRACT

The paper describes results of a survey of State Transportation Agencies in the United States that was conducted to identify staffing plan practices and concerns. A staffing plan involves recruiting, training, and retaining employees with skills to do the work needed in order for the organization to efficiently reach its objectives. Staffing plan areas that were studied in the survey include general information about the state transportation agency, including the strategic plan and staffing plans; recruitment; right-sized workforce, determining the right number of employees to perform a job; flexible workforce, the ability to change the work performed and the work location; retention; and succession planning.

All fifty states participated in the survey. The survey responses demonstrated that most state transportation agencies have at least one primary area in human resources they consider as innovative, and that there is a broad-based interest among states to cooperate in exploring new and better methods. The highest staffing plan priorities among state transportation agencies are employee recruitment, performance measures, and employee retention. State staffing plan priorities, current innovation in these areas, and strong interest in cooperating with other states provide a basis for broad-based improvement in staffing plans among the states and as a nation.

BACKGROUND

Constraint on the number of employees in State Transportation Agencies leads to assessment of how to do better with fixed or fewer staff. The importance of resource allocation is keener when there is an increase in transportation programs. The increased Work Program resulting from the Transportation Efficiency Act for the Twenty-First Century (TEA-21) underscored the need for thoughtful development of Human Resource capabilities. Identifying needs and innovative practices among states has the potential to provide immediate assistance to human resource programs. Relating innovative practices and directions to an integrated Staffing Plan in State Transportation Agencies has the potential to provide long-term benefits.

RESEARCH PROCESS

The Staffing Plan research process included a literature review; expert interviews; draft survey review and comment; survey pretests; survey distribution; data reduction and report review. The research was directed toward the development of a Staffing Plan survey, which is a type of organizational survey (*I*). The survey design began with a review of human resource literature.

Two committees advised the research. The AASHTO Administrative Subcommittee on Personnel and Human Resources contributed to the concept, design, development and implementation of the survey. In addition, a Staffing Plan Research Advisory Committee (RAC) was formed within the New Mexico State Highway and Transportation Department. Participants were selected to reflect the diverse geographic locations, job classifications, and employee demographics of Department employees.

Following revision of the initial draft survey based on the State RAC and AASHTO Subcommittee reviews, two survey pretests were conducted. One pretest was with a Highway District management team. This provided insight from transportation domain experts representing both Human Resource and other management perspectives and insight. The second pretest was with graduate students in business management at the University of New Mexico. The graduate class included students who work in Human Resources in the private sector, but who have no transportation domain expertise. This ensured the broad set of Human Resource issues was addressed, and that the questions were well framed and as free as possible from jargon.

Following the second pretest, an analysis plan was formalized to understand and report survey results. Surveys were entered into the analysis database, and the discussion draft report produced. Both the AASHTO Subcommittee and the State RAC critiqued the preliminary report. A final report was prepared and distributed to all states.

LITERATURE REVIEW

General Human Resources Literature

This study will specifically address human resources planning, which is defined by Caruth and Noe as a "...systematic, ongoing activity that ensures that an organization has the right numbers and kinds of people in the right jobs at the right time so that the organization can achieve its stated objectives"(2). Human resources planning involves a systematic dynamic process related to an organization's business plan (3) and includes three key elements: forecasting the demand for labor, performing a supply analysis, and balancing supply and demand considerations (4). Due to space limitations, the detailed summary of the general human resource literature related to human resource planning as

well as the specific transportation human resources literature are not outlined here. This information is available in the full research report.

THE SURVEY

The survey was developed and analyzed using a multi-stage process. The stages include preliminary interviews for issue identification, pretests of the draft survey, survey distribution, data collection, data reduction and data analysis. Subjects of primary concern to state transportation agencies organize the survey. The subject areas are: general information about the state transportation agency, including the strategic plan and staffing plans; recruitment; right-sized workforce, determining the right number of employees to perform a job; flexible workforce, the ability to change the work performed and the work location; retention; and succession planning. Each stage of the process will be delineated below.

Preliminary Interviews for Issue Identification

Members of the AASHTO Administrative Subcommittee on Personnel and Human Resources were interviewed. The preliminary interviews provided insight into current practice and priorities among regionally distributed State Transportation Agencies. The interview results helped the research team prepare a first draft of the survey that addressed agency needs in addition to reflecting general and transportation domain literature.

The AASHTO Subcommittee and the State RAC were asked to comment on the draft survey. Revisions were made based on the critique. After all comments were considered, a pretest draft was prepared.

Survey Pretests

Pretests were conducted to improve the clarity of the survey and the usefulness of the results. The concerns were with measurement variation and measurement bias. Measurement variation occurs when the same question is understood in different ways and responses vary as a result. Measurement bias occurs when the response to a question is incorrect. Measurement error is the result of measurement variation and bias (*I*). The draft surveys, pretests and discussion of the pretests also allowed for a check on deliberate response bias.

Data Collection

The Staffing Plan Survey was distributed to each State Transportation Agency. Each agency was sent two letters and copies of the survey. One letter and survey was addressed to the Chief Administrative Officer. The second letter and survey was addressed to the Human Resources Director. The letter was co-signed by the Executive Director of AASHTO and the Chairperson of the AASHTO Subcommittee on Personnel and Human Resources. The letter emphasized the potential importance of the survey to each agency, and to Human Resource practice among State Transportation Agencies. The week after the surveys were mailed, each state was contacted by telephone to encourage submission of the survey.

Data Reduction

Data Reduction Plan

Data from the state surveys were entered into a file for SPSS analysis. For the final report, data entries were checked by a second person to help ensure accuracy. The research team reviewed data analyses for consistency and provided a third check on

survey data. Frequencies, correlation analysis and analysis of variance, as appropriate, were performed on the data.

Discussion of Results

A discussion draft of the staffing plan report was prepared using the first thirty returned state surveys. The discussion draft was distributed in July 1999. The draft report was sent for comment to the AASHTO Administrative Subcommittee on Personnel and Human Resources, the New Mexico State Staffing Plan Research Advisory Committee, and the Transportation Research Board Committee on Management and Productivity. Comments from these groups were used to refine the document and prepare the final report with data analyzed from all state surveys. Surveys from all states were received by the end of August.

Data Analysis

The analysis was conducted as planned, with the exception of one addition to the plan that resulted from review of survey data. During the analysis of survey responses, one set of results appeared questionable. The survey responses to state highway system lane miles and Annual Vehicle Miles Traveled (AVMT) were not correlated with Full Time Equivalent Employee (FTE) responses. Indicators of workforce demand (lane miles and FTEs) were expected to be related to some extent to indicators of workforce supply (FTEs). A second source of lane mile and AVMT data was sought. A Federal Highway Administration source was identified and used (5). Data from the second source were compared with the survey responses. Both sets of data were compared with each other and FTEs. The second source and comparisons are detailed in the survey results section.

SURVEY RESULTS

Survey Response and Determination of Significant Findings

All state transportation agencies returned the Staffing Plan Survey. The following results, therefore, represent state transportation agency staffing plan practice, attitudes and direction in the United States. In this report, statistically significant relationship among the data is described, followed by the extent of correlation in parentheses. The first number within the parentheses is the Pearson Correlation, and the second number is the significance, using a two-tailed test. The higher the first number the stronger the correlation. The lower the second number, the more significant the relationship. In this study, the minimum threshold for statistical significance is .10, which essentially means that there is a 90% chance that the relationship will be observed.

It was noted earlier that in some instances more than one question was asked to indicate the same staffing plan issue or concern. The relationship among multiple variables for the same subject can provide useful information about staffing plan needs and opportunities. The responses to these sets of questions were correlated with other individual survey responses and sets of questions. The level of correlation using sets of questions is presented in the same manner as for correlation between responses to individual questions.

General Information about State Transportation Agencies

Population and Unemployment

States were asked to identify state population and unemployment for 1990, 1995 and 1999. For the same years, states were asked to note their Department budget, including state and federal funds, for all purposes. These data were requested to

determine if staffing plan issues were related to states with similar population or unemployment characteristics. Population is one indicator of change in transportation demand, and therefore workload for a state transportation agency. Budget information was also requested as an indicator of agency workload.

Population

The population of the United States increased by approximately 1% a year since 1990 (5). The primary growth was in the western portion of the nation. While each AASHTO region had a population increase, the WASHTO States had the highest increase. WASHTO states reported a 14.7% population increase from 1990 to 1999. This matches very well with the Bureau of the Census for different but comparable West Census region with a 14.1% increase from 1990 to 1998 (5).

As state population increases, state transportation agency budget and number of Full Time Equivalent Employees (FTEs) increases. 1999 state population was highly correlated with 1999 budget (.94, .001) and 1999 FTEs (.92, .001).

State Unemployment Rate

State unemployment data can be compared with state identification of staffing plan concerns such as recruitment and retention. Data from 1990, 1995 and 1999 establish a trend and the 1999 datum establishes unemployment in the most current year for each state.

Department Budget

Change in total budget is one indication of the work of an agency. States were asked to indicate total Department budget for 1990, 1995 and 1999. This provides a trend in budget as well as a basis for budget comparison among states. There was a 56%

increase in budget from 1990 to 1999. The larger the budget the greater the commitment to quality initiatives (.40, .01). This is also observed for budget increase. The states with higher increases in budget tend to have a greater commitment to quality management. (.36, .02)

The change in budget is not correlated with the change in transportation agency FTEs. Absence of a statistically significant relationship between an indicator of increased workload, such as growth in budget, and FTEs is a concern. The change in budget is not related to human resource autonomy, or ability of the agency to influence the number of FTEs. Change in budget from 1990 to 1999 is not significantly correlated with responses to any other survey question, except for quality management.

States were asked to indicate highway lane miles currently on their State Road System and the Annual Vehicle Miles Traveled (AVMT) for their system. These statistics provide a basis for understanding Department workload. The number of lane miles in a state highway system is an indicator of workforce demand, particularly in relation to the highway maintenance workforce. The AVMT on a state highway system is an indicator of the level of use of the system. Both statistics are annually reported by states to the Federal Highway Administration (6). This report provided a second source of information for lane miles and AVMT.

Survey responses to the lane miles and AVMT were inconsistent and did not provide an adequate basis for comparison. The responses to these questions identify a gap in internal information within some state transportation agencies between persons concerned with indicators of workforce demand and the persons concerned with workforce supply. While there is a lag between data submitted by states and FHWA

publication, the problems in responding to these questions were not a result of the human resources personnel using either past published data or recently submitted data. Data from different, recent reporting periods were all considered valid responses to the question, as were differences in rounding.

The state survey responses as well as state reports to FHWA on AVMT and lane miles were both correlated with FTEs. The FTE data were total FTEs, Highway-related FTEs, and FTEs for Design, Construction and Maintenance. The results are shown in Table 1.

TABLE 1 Workforce Demand and Supply Comparison Lane Miles and Annual Vehicle Miles Traveled Statistics and Full-Time Employees Pearson Correlation Coefficients

Variable	1	2	3	4	5	6	7	8	9
1. Lane Miles (survey)-									
2. Lane Miles (FHWA)		-							
3. AVMT (survey)		.47	-						
4. AVMT (FHWA)		.54	.75	-					
5. Total FTEs		.69	.76	.90	-				
6. FTEs - Highway	.45	.81	.62	.80	.84	-			
7. FTEs – Design		.39	.75	.86	.79	.73	-		
8. FTEs - Construction		.60	.71	.83	.91	.72	.72	-	
9. FTEs - Maintenance		.78	.65	.70	.90	.72	.47	.79	-

The data reported to the FHWA for lane miles are highly correlated with state transportation agency FTEs, while the staffing plan survey response to lane miles is not

correlated. This suggests the data already collected by states for lane miles have the potential to be used to relate indicators of workforce demand to workforce supply, if the correct statistic is used for this purpose. This may be helpful for states interested in developing quantitative models.

The responses to the staffing plan survey and the FHWA reported AVMT statistics are both correlated to FTEs. However, the FHWA reported data are more highly correlated with each FTE variable.

One reason for information sharing between the Human Resource area of an agency and the area responsible for reporting system demand or use such as AVMT is forecasting workload demand. If agencies evaluate workforce models that incorporate estimates of demand, familiarity with already collected and reported data would be helpful in assessing the models and forecasts. To test this relationship using the staffing plan survey, states with a workforce forecasting method were grouped and their responses to the survey were separately analyzed. States without a workforce forecasting method provided responses to the AVMT questions that were not correlated with FTEs, budget, or other questions. States identifying a workforce forecasting method provided responses that were highly correlated with 1999 FTEs (.77, .001) and budget (.90, .001).

Several questions within the questionnaire requested states to indicate level of agreement with each of nine descriptive statements about their Department. Responses were Strongly Disagree, Disagree, Neutral, Agree and Strongly Agree. Scores of 1 (Strongly Disagree) through 5 (Strongly Agree) were used to calculate the responses to each statement. Four items were combined into an indication of autonomy to make decisions on FTEs. With a mean of 2.50 and a standard deviation of 0.73, states indicate

they have limited ability to make decisions about the number of employees in their agency. This is significantly related to the question on change in budget and change in FTEs.

With a mean of 3.10, states generally believe that there is little need to change the number of job classifications. However, it should be noted that one-third of the states perceive there is some need to change the number of job classifications, and two-thirds of the states believe there is no need.

Only two states, Pennsylvania and Massachusetts, stated that unions control most decisions regarding their employees. Nationally, there is not a strong union role in employee issues related to state transportation agencies.

Two questions addressed commitment to quality management. A mean of 3.91 demonstrates the commitment of states to quality management principles, and suggests an opportunity to frame constructive human resource changes in the context of these principles. A commitment to continuous improvement is significantly and positively related to having a strategic plan.

States were asked how many unions represent their Department's employees. The mean was 3, the median was 1, and the range was 0 to 15. This reflects the low assessment of the role of unions.

States were asked to identify if they have a strategic plan. Forty of the fifty states indicated a strategic plan. For those states with a plan, thirty-five responded it was communicated to all Department staff. Having a strategic plan is positively related to continuous improvement (.37, .01), and commitment to quality management (.34, .02). That is, states with a strategic plan tend to affirm these aspects of the National Quality

Initiative more highly than states without a strategic plan. Another interesting relationship is that having a strategic plan is negatively related to time to interview (-.29, .06), select (-.62, .001), and have new employees report to work (-.26, .08). That is, states with a strategic plan tend to take less time in these steps in the recruitment process than states without a strategic plan.

Of the states with a strategic plan, twelve responded that they have a formal staffing plan. Seven states identified the length of time they have implemented a staffing plan. The average is 12 years and the range is 2 to 25 years. For ten of the above states, their staffing plan is related to their strategic plan.

Having a formal staffing plan is positively and significantly related to using internal assessment teams for determining the overall range of employees needed in construction (.37, .02) and design (.39, .001). Having a staffing plan is also significantly and positively related to the number of positions vacant when outsourced (.92, .001), indicating that those states with a staffing plan knew and used the vacant positions when outsourcing was needed. Having a staffing plan was significantly and positively related to formally planning for the number of workers and skills needed in the future (.39, .01). Interestingly having a formal staffing plan was significantly and negatively related to difficulty in retaining employees because of dissatisfaction with salary (-0.34, .03). Thus, states with a staffing plan tend to have fewer problems with salary dissatisfaction.

The survey addressed differences in the number of employees and trend in number of employees among state transportation agencies. The change in FTEs from 1990 to present is important. For all reporting state transportation agencies, there was a decrease of 5.3% in FTEs during the decade. While most states had a decrease, there are

eleven states with an increase in FTEs over this period. Total FTEs in this question is related to change in budget. While Department budgets have generally increased over the past decade, Department FTEs have generally decreased.

States were asked to identify the average span of control in their organization. This is the average number of employees directly reporting to a supervisor. The mean is 7 and the median is 6. In addition, states were asked to state the highest number of levels of management including the Cabinet Secretary or Director to non-supervisory employees. The mean and median are 6.

States were asked to note the number of levels of management from and including the Cabinet Secretary or Director to the Human Resources Director. The mean is 3, the median is 2, and the range is 1 to 5. This suggests that in most states the Human resource Director has a close organizational relationship to top management. Furthermore, states were asked to what position the Training Director reports. The Training Director reported to the Cabinet Secretary or Director in 0 states, the Deputy Secretary or Deputy Director in 5 states, the Human Resources Director in 34 states, and 11 states to some other position.

States were asked to note the functional areas of the Department that have been entirely or partially outsourced in the past five years. For this survey, “outsource” was defined as work previously performed by Department employees that is now a purchased service performed by non-Department employees. Thirty-five states outsourced design, 33 maintenance, 30 construction management, 29 right-of-way and fewer states outsourced other areas. States were asked to state the total reduction in FTEs as a result of outsourcing over the past five years. Thirty-two states responded. The mean was 23,

the standard deviation is 48, with a range of 0 to 189. The high standard deviation is a result of 23 states indicating no outsourcing in the past five years, and 9 states having reduced FTEs as a result of outsourcing over the same period. Eleven states have conducted outsourcing studies. The studies provide an opportunity for information exchange among interested states.

Recruitment

This section of the Staffing Plan survey addressed attracting and hiring staff. Several statements addressed agency practice and recruitment concerns.

<u>Statement</u>	<u>Mean</u>	<u>Standard Deviation</u>
a. This agency formally plans for the number of workers and skills needed in the future.	3.04	.99
b. Our Department has problems recruiting staff with skills adequate to the jobs we need.	3.50	.93
c. Our Department has problems recruiting Civil Engineers.	3.72	.97
d. Our Department has problems recruiting Information Systems personnel.	4.06	.74
e. Our Department has problems recruiting staff with certified technical skills which do not require a college degree.	3.58	1.03
f. Our Department has problems recruiting staff because of competition with the private sector.	4.04	.90
g. Our Department has problems recruiting staff	3.04	1.07

because of competition with public agencies.

h. Our Department has problems recruiting 3.84 1.06

because of low entry-level salaries.

i. Our Department has problems recruiting staff 3.68 1.11

because of a low level of unemployment.

The responses suggest that all of the statements represent something of a problem, with no mean below a 3.0. The primary problem in recruitment among state transportation agencies is for Information System personnel. This statement had the highest level of agreement and lowest variance of all recruitment concerns.

Table 2 shows the relationship between problems recruiting job classifications and reasons the states identified for their problems. The numbers in the table indicate significant correlation between the variables at a probability level of .05. The larger the number the stronger the relationship.

Four types of employees were analyzed in terms of recruitment concerns, including staff with adequate skills to do the job, civil engineers, information systems personnel, and staff with certified technical skills. Departments indicating problems in recruiting one type of employee tended to have problems recruiting all four types of employees. In addition, problems recruiting employees were significantly related to competition with the private sector and low entry level salaries. Problems recruiting due to competition with the public sector were significantly related to recruiting civil engineers, staff with skills needed to do the job, and staff with certified technical skills. Competition with the public sector was not related to information systems personnel.

TABLE 2 State Transportation Agency Recruitment Difficulties^a

	<u>1.</u>	<u>2.</u>	<u>3.</u>	<u>4.</u>	<u>5.</u>	<u>6.</u>	<u>7.</u>	<u>8.</u>
1. Staff with adequate skill	-							
2. Civil engineers	.63	-						
3. Information Systems personnel	.28	.51	-					
4. Staff with certified Technical skill	.63	.47	.27	-				
5. Because of Competition with the private sector	.63	.76	.52	.61	-			
6. Because of Competition with public sector	.33	.50		.39	.55	-		
7. Because of low Entry level salaries	.62	.73	.33	.50	.73	.55	-	
8. Because of low Level of unemployment	.41	.27		.52	.50	.42	.51	-

^aSignificant correlation between the variables at a probability level of .05

There is a relationship between perceived problems recruiting because of a low unemployment rate and recruitment of certified technical workers (.52, .001), civil engineers (.27, .06), and employees with adequate skills to do the job (.41, .01). While there is a perceived relationship, the actual unemployment rate for 1999 and the change in unemployment rate from 1990 to 1999 are not significantly related to problems in recruiting certified technical personnel. Unemployment rate for 1999 and change from 1990 to 1999 was examined for all states, and the results demonstrated a lack of correlation with recruitment of certified technical personnel, employees with adequate skills, and civil engineers. This suggests there are likely other, underlying reasons why

there is a nationwide difficulty among state transportation agency recruitment of certified technical personnel other than state unemployment rate.

States were asked to list effective recruitment programs. Thirty-two states noted fourteen different recruitment programs. The most popular is college or technical school campus recruitment and job fairs, with 21 states identifying this as a successful recruitment program. Nine states have internships or tuition reimbursement programs as part of their recruitment program. Eight states noted Internet recruitment, while five states mentioned focused recruitment of women and/or minorities.

States were asked when hiring employees, what is the time required for the steps in the hiring process. Statistics are rounded to the nearest day.

TABLE 3 State Transportation Agency Typical Time to Hire Employees

<i>Activity</i>	<i>Time In Days</i>				
	Mean	Median	Standard Deviation	Range	Sample Size
a. What is the typical length of time from a vacancy coming open, to advertising being closed for the position?	33	21	35	5-180	47
b. What is the average length of time after the advertising has closed to completing candidate interviews?	28	21	25	4-120	48
c. What is the average length of time after interviewing candidates to select the individual and make a job offer?	8	7	6	2-30	48
d. What is the average length of time after making a job offer that the individual is at work?	16	14	5	7-30	47
Total Hiring Process	76	58	47	33-238	

The survey results indicate the significant differences among states in the time required for specific steps in the hiring process, as well as for the overall process.

There are seven questions that were used to represent recruitment as a set of responses. This set of recruitment questions was analyzed in relation to the set of questions related to employee retention and the set of questions related to perceived agency human resource autonomy. Recruitment is positively correlated with retention and negatively correlated with autonomy. State transportation agencies that have difficulty with employee recruitment tend to have difficulty with employee retention. This suggests that a staffing plan should integrate at least these two elements of human resource concern. Concerns with recruitment tend to increase as perceived human resource autonomy tend to decrease. This suggests that staffing plans should be developed by state transportation agencies cooperatively or with the advisement of other, related organizations.

Right-Sized Workforce

Right-Sized Workforce is determining the right number of employees to perform a job. States were asked to identify if they have certain types of employee information on a computer database. Thirty-four states had information on training history, 20 on formal education, 11 had information on past work experience, and 7 an inventory of employee skills and abilities.

States were asked to identify if they have certain types of job information on a computer database. Twenty-four states had information on minimum requirements for the job, 17 states job skill requirements, and 12 states desirable requirements.

States were asked if they relate employee information to job information using computer databases. Eight states stated they do relate employee to job information using their computer databases. This is an area of opportunity for Staffing Plan development, and for sharing by these states.

States were asked to identify the primary method used to forecast the number of employees needed for the coming year, as shown in Table 4.

TABLE 4 Personnel Forecast Methods Used by State Transportation Agencies

<i>Forecast Method</i>	<i>Number of States</i>		
	Design	Construction	Maintenance
a. Historical precedent	34	32	32
b. Trend analysis (using factors to explain staff increase or decrease)	17	18	16
c. Other	6	8	10

The response to this question is related to growth in budget and decrease in FTEs. The use of historical precedent may not be the most effective way of relating FTE needs to workload, and communicating FTE needs.

There are several methods that can be used to determine either a number or range of employees needed to perform a job. External norms are professional standards for productivity. Internal Assessment Teams are groups within an agency that indicate the number of people needed to perform a job. External Assessment Teams are persons from outside the agency with specific knowledge or experience who indicate the number of people needed to perform a job. Table 5 presents the number of states using the

alternative methods to determine the number or range of employees needed to perform a job.

There is a correlation between the change in unemployment rate and state use of external assessment teams for assessing workforce requirements for highway design (.36, .02); highway construction (.32, .04); highway maintenance (.42, .01); and, use of internal assessment teams for design (.31, .05), construction (.26, .10), and maintenance (.26, .10). Change in unemployment rate was also related to difficulty in retaining employees due to dissatisfaction with location of the agency (.27, .08) and lack of job security (.33, .03).

TABLE 5 The Number of State Transportation Agencies Using Alternative Methods To Determine the Number or Range of Employees To Perform a Job

Method	Design	Construction	Maintenance
a. External Norms	10	10	8
b. Internal Assessment Team	34	36	34
c. External Assessment Team	5	5	5
d. Other	7	8	8

States were asked if their Department has training programs for employees on how to cost the products and services they provide to the public. Eleven states stated they do. The responses to this question were significantly and positively related to the commitment to implementation of quality management principles.

States were asked to list any innovative programs in place to estimate and forecast the right number of employees required to accomplish work. Fifteen states identified innovative forecasting programs. Five states mentioned innovative pre-construction,

construction or maintenance management system. Thirty-nine states indicated a strong interest in working with other states on forecasting needed personnel.

Flexible Workforce

A flexible workforce is the ability to change the work performed and the work location of persons performing the work. Questions were related to the ability to assign employees based on needed work and cross training. Overall, states agreed that the workforce needs to be flexible. Findings indicate that states that tend to be flexible in one area also are flexible in other areas.

Table 6 shows the number of employees impacted by specific policies and procedures.

TABLE 6 The Number of State Transportation Agency Employees Impacted by Flexible Workforce Policies

	<u>1995 through 1998</u>		<u>1999</u>	
	Number Of States	Mean Number Of Employees	Number Of States	Mean Number Of Employees
a. How many employees have been permanently relocated to perform work in other geographic areas?	20	23	29	11
b. How many employees have been temporarily relocated to perform work in other geographic areas?	20	139	21	47
c. How many employees have been cross-trained to do more than one job in your Department?	20	413	14	205

Table 7 identifies the number of states providing incentives to employees who are cross-trained or who are geographically relocated. States were also asked if employees have the option of selecting alternative work schedules. If so, they were asked to note both the year the option was first provided and number of employees using the option.

TABLE 7 Flexible Workforce Incentives in State Transportation Agencies

<u>Number Of States</u>	<u>Percent of States Responding</u>	<u>Area of Flexible Workforce</u>	<u>Incentive</u>
<i>Cross-Training</i>			
a. 9	29		Recognition programs
b. 6	19		Individual financial reward
c. 3	10		Team financial reward
d. 20	63		Promotion opportunities
e. 0	0		Other
<i>Geographic Relocation</i>			
a. 1	3		Recognition programs
b. 8	25		Individual financial reward
c. 1	3		Team financial reward
d. 18	58		Promotion opportunities
e. 3	10		Other (relocation assistance)

For this survey, flex time is defined as flexible working hours which permit employees the option of choosing daily starting and quitting times, provided they work a certain number of hours per day or week. Job sharing is defined as an arrangement whereby two part-time employees perform a job that otherwise would be held by one

full-time employee. Telecommuting is defined as the use of microcomputers, networks, and other communications technology to do work in the home that is traditionally done in the workplace. Compressed work schedule defined as when the number of days in the workweek is shortened by lengthening the number of hours worked per day.

TABLE 8 State Transportation Agency Employees Utilizing Alternative Work Schedules

Alternative	Median Year Implemented	Average Number of Employees	Standard Deviation	Range	Number of States
a. Flex Time	1985	1,247	3.125	0-14,000	42
b. Job Sharing	1991	18	30	0-100	20
c. Telecommuting	1995	84	116	2-400	23
d. Compressed Schedule	1990	417	638	0-2,316	41

As indicated in Table 8, more employees use flex time and compressed work schedules than job sharing and telecommuting. In flex time and compressed work schedules, there is a significant difference in the number of employees affected in different states as reflected in the standard deviation and range. States were asked to identify if their Department has in place an innovative flexible workforce program, such as geographic shifting of employees to where work is needed or cross-training. Eight states indicated an innovative practice in this area.

Retention

Retention is keeping valuable employees. This question provides statements and a Likert response scale as previous survey questions. The statements concern factors in staff turnover.

<u>Statement</u>	<u>Mean</u>	<u>Median</u>	<u>Standard Deviation</u>
a. Managers are expected to develop training plans with their employees as part of the annual performance review process.	3.74	4.0	1.01
b. We have difficulty retaining employees because of perceived limits on promotion within our agency.	3.20	3.00	0.95
c. We have difficulty retaining employees because of dissatisfaction with the location of our agency.	2.02	2.00	0.62
d. We have difficulty retaining employees because of lack of job security.	1.62	2.00	0.53
e. We have difficulty retaining employees because of early-out retirement programs.	2.48	2.00	1.11
f. We have difficulty retaining employees because of the uninteresting nature of the work.	2.02	2.00	0.51
g. We have difficulty retaining employees because of dissatisfaction with salary.	3.62	4.00	1.03
h. We have difficulty retaining employees because of dissatisfaction with work conditions.	2.46	2.00	0.79
i. We have difficulty retaining employees because of dissatisfaction with supervisors.	2.64	2.00	0.78

States identify the primary retention problems as difficulty in promotions and low salaries. However, it should be noted that for both these problems in employee retention there is high variability among the states indicated by the standard deviation. For some states, these problems are of exceptional concern, while for other states it is not a problem. There is general agreement among the states that other identified factors are not a major concern.

The survey asked about retention problems with specific classifications.

<u>Classification</u>	<u>Mean</u>	<u>Median</u>	<u>Standard Deviation</u>
j. We have difficulty retaining Civil Engineers.	3.28	3.50	1.07
k. We have difficulty retaining Information Systems personnel.	3.72	4.00	0.78
l. We have difficulty retaining personnel with certified technical skills that do not require a college education.	2.92	3.00	0.94

State transportation agency concerns with recruitment parallels concerns for employee retention. The primary concern is for Information Systems personnel. There is a concern for Civil Engineers, and a somewhat lower concern for retention of personnel with certified technical skills. It is noteworthy, however, that among the states, difficulty in retaining Civil Engineers is assessed more closely to that of persons with certified technical skills than to difficulty retaining Information Systems personnel.

States were asked if their Department provides performance-based compensation. Twenty states, or 42% of the 48 states responding to this question, stated they do. Performance-based competition was significantly and positively related to agency

autonomy (.30, .04), commitment to continuous improvement (.29, .05), larger FTE reductions due to outsourcing over the past 5 years (.42, .02), and flexibility (.43, .01). The three components of flexibility were each independently significantly related to performance-based compensation. These included the ability to assign employees to perform needed work whether or not it is in the employee's formal job classification (.39, .01), the ability to assign employees to perform needed work in other geographic locations (.32, .03), and encouragement of employees to learn more than one job (.25, .09). Thus, performance-based compensation systems are significantly related to agency autonomy, flexibility and continuous improvement.

States were asked to identify innovative programs now in place to retain employees. There were twenty-five states that indicated innovation in employee retention. Six states provide merit or productivity-based incentives and six states reimburse tuition or give a bonus for certification. Other innovative practices include Florida's Deferred Retirement Option Plan, retention bonuses in Indiana, and an aggressive cost-of-living adjustment in West Virginia.

Several of the reasons for having difficulty retaining employees were related to each other. A perceived limit on promotion was significantly related to dissatisfaction with location, dissatisfaction with salary, and dissatisfaction with work conditions. Dissatisfaction with location of the agency was related to the uninteresting nature of the work, dissatisfaction with salary, dissatisfaction with work conditions, dissatisfaction with supervisors and perceived limits on promotion. Difficulty in retention due to lack of job security was significantly related to the uninteresting nature of the work. The

variable of early out retirement programs did not have a statistically significant relationship to any other variable.

Dissatisfaction with salary was significantly correlated with significant limits on promotion, dissatisfaction with location, uninteresting nature of work, and dissatisfaction with work conditions. Dissatisfaction with supervisors was significantly related to dissatisfaction with location and with work conditions.

Three types of employee classifications were analyzed in relation to retention variables. The results indicate there is difficulty retaining civil engineers and personnel with certified technical skills due to perceived limits on promotion and dissatisfaction with salary. In addition, difficulty retaining personnel with certified technical skills is correlated with dissatisfaction with supervisors.

Succession Planning

Succession Planning is ensuring there is a qualified pool of employees for key positions. States generally did not believe that the agency identifies and inventories employee skills (mean = 2.35). The relatively low score for effective identification and inventory of employee skills reflects the low number of states that have computer databases for this purpose. Four states have a formal succession plan in place.

Succession planning was highly rated among all states as an area needing improvement.

National Priorities

States were asked to rank order from 1 (highest) to 17 (lowest) the issues that are of most concern to their Department regarding “staffing plans”. This provides insight into the human resource issues of national concern. Table 9 presents the staffing plan issues in rank order. The issues are in order of priority, and are grouped. The state

responses establish an agenda for staffing plan development. While the states indicated a strong willingness to participate in a variety of new practices, the areas of primary current interest are presented in the states' priorities.

TABLE 9 State Transportation Agency Staffing Plan Priorities

Rank Group	Rank	Staffing Plan Issue
Very High	1	Recruitment
Very High	2	Retention
Very High	3	Performance Incentives
High	4	Performance Measures
High	5	Succession Planning
High	6	Hiring
High	7	Training
Average	8	Cross-Training
Average	9	Forecasting Work Demand
Average	10	Flexible Workforce
Average	11	Inventory of Employee Skills
Low	12	Right-Sized Workforce
Low	13	Inventory of Job Skills
Low	14	Number of Job Classifications
Very Low	15	Outsourcing
Very Low	16	Reorganization
Very Low	17	Union Relationships

TOWARD THE FUTURE

The Staffing Plan Survey provides a snapshot of current human resource practice at the end of the twentieth century. The survey results also identify the concerns, commitments, innovations and directions among the states that will carry into the twenty-first century.

There is an opportunity for state transportation agencies, using the forum provided by AASHTO and the four administrative regions, to work together to advance human resource practice. Other forums, such as TRB, provide the opportunity to refine assessment and future directions through peer review. Key information is available as a result of this survey on national and regional priorities, and on innovative practices among states. The challenge is to move from information to implementation of effective human resource practices. Improvement of human resource practice will require the resolve to use the information, focus current innovation, and sustain the momentum toward an effective and integrated staffing plan in state transportation agencies.

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