

Abridgment

Innovative Strategies for Upgrading Personnel in State Transportation Departments

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The most crucial problem facing departments of transportation in the next decade will be the shortage of professional employees to create and maintain roadways. Between now and 2000, the work force will grow more slowly, the number of new workers entering the labor force will decline, and the fastest-growing job market will be in professional, technical, and sales fields, which also require the highest educational and skills levels. The challenge to meet staffing needs is compounded by high turnover at senior levels anticipated by state departments of transportation and the fierce competition for entry-level professionals. To explore this human resource situation, AASHTO and FHWA sponsored a study that addressed the shortages and the strategies employed by state departments of transportation to cope with or prevent shortages. An overview of the results of the study and the related activities being undertaken by the Texas State Department of Highways and Public Transportation is presented. Among the strategies the responding states reported are broadening the mix of in-house technical skills; consistent upgrading of skills and knowledge, especially in computer technology; and the development of professional engineers and managers to fill the leadership void. Implementation of the strategies involves recruitment, training, and management development techniques that offer long- and short-term solutions. A common thread running through the survey responses from all states was the priority placed on creating a positive work environment—one born of the knowledge that human resources are both the present and the future of transportation.

More than ever, it is time to look toward the future—the end of this century and beyond. Across the nation, departments of transportation are facing a new decade and new demands. The most crucial demand is focused not on the roadways themselves, but on the engineers and personnel who work to create and maintain them.

Almost all states have predicted shortages of professional employees in their highway departments. Among the reasons are the high rate of retirement, the changing emphasis and growth of programs in the departments, and a shrinking supply of civil engineering graduates. These factors combine to create two challenges for all departments of transportation: to upgrade their existing professional personnel and to attract what new engineers are available. However, the challenges are not mutually exclusive. If training is increased, benefit programs are improved, and incentives for existing engineering personnel are built, not only will those engineers be

upgraded and retained, but also working for the highway departments will be made more attractive to new engineering graduates.

To explore this human resource situation, a study was sponsored by AASHTO and FHWA and conducted in the National Cooperative Highway Research Program. Using a mail-out survey sent to all departments of transportation in the United States and Canada, the study addressed the problems of existing or predicted shortages of qualified professional, technical, and managerial personnel, as well as strategies for coping with or preventing the shortages from occurring. The questions were designed to explore existing public-sector recruitment, training, and management development techniques and to identify innovative techniques employed by particular state departments of transportation. The results of the survey were summarized in *NCHRP Synthesis of Highway Practice 163 (1)*. An overview of the results of the study are presented.

Between now and 2000, the following trends are forecast: the work force will grow more slowly than at any time since the 1930s, the number of new workers entering the labor force will decline, and the fastest-growing job market will be in professional, technical, and sales fields, which also require the highest educational and skills levels. For state departments of transportation in particular, the trends are accentuated by the high turnover rate. For example, up to one-third of all transportation engineers will retire by 1995. Whether the retirements are due to aging, personal financial considerations, or service completed, the high turnover at the senior level creates a leadership vacuum. The vacuum is critical. The pool of experienced professionals to fill the positions vacated above them is shallow. These changes in the departments, combined with the fierce competition for entry-level professionals, create the challenge: to recruit and retain qualified engineering professionals. In response to the challenge, government agencies in general need to invest heavily in the continuing development of their personnel.

Several strategies were identified in the study. First, many agencies' efforts have, with time, shifted from traditional highway construction to rehabilitation, repair of bridges and structures, and a serious commitment to preventive maintenance. Therefore, the mix of in-house technical skills must be broadened to meet the change in focus. Second, advanced technology, especially in computers, requires the consistent upgrading of skills and knowledge to address and fully utilize

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that state-of-the-art technology. Third, the leadership vacuum mentioned earlier requires the development of professional engineers and managers to fill the vacancies at the top.

State departments of transportation must identify recruitment, training, and management development techniques that offer long- and short-term solutions. Human resources forecasting and planning is one area that offers solutions. Research activities in this area allow management to get the information necessary to formulate and implement effective policies and programs to better prepare for future needs.

In their recruitment programs, it is essential that public agencies offer competitive salaries and benefits throughout their job series and grade structures. If government agencies can combine positive recruitment strategies with increased supervisory discretion during the hiring process, they can begin to overcome some of the traditional handicaps in competing with the private sector.

Training is another area that can yield solutions to the human resource problem. Training of all kinds is recognized to be a necessary investment in the human resource base of organizations. Employee orientation programs; technical training for both new and established employees; and supervisory, management, and executive development training are all efforts that can keep existing personnel fully trained. Besides maintaining their productivity for jobs in which they now serve, the programs also prepare them for jobs in the future. For example, management training and development at the middle level can help prepare individuals of the organization to "step up" into positions that open above them, filling the leadership vacuum.

Human resource management has become increasingly performance oriented. Merit pay plans, performance appraisals, and decentralization of personnel policy for increased adaptability to current demands are but three strategies that, if implemented, can foster better productivity and loyalty.

In fact, many departments of transportation have begun to recognize the importance of people as their most important resource and have begun to revise their organizations, cultures, and training accordingly. A thread running through all the responding states' programs was the priority placed on creating a positive work environment. A second thread is the changing approach to training. Classes, instead of being geared to only one or two positions, are being broadened to include more employees and to encourage them to attend training programs and develop skills outside their present job. Both factors enhance long-term careers in state departments of transportation.

Texas is taking a more developmental approach to performance management. For many years, management by objective (MBO) has been its main management tool. To adapt to the new emphasis on training and on identifying training needs, the MBO was revised to include a more detailed performance appraisal system. The new performance planning and evaluation form involves both supervisor and employee in the setting of job responsibility, training objectives, task design, and career development plans. Although it is too early for hard conclusions, signs indicate that the new form increases communication between management and employees, which is leading to more effective and creative development of the staff. The *Supervisors Handbook* sums it up: "Supervisors are responsible for the effective use of resources, and our people

are our most important resource. Thus, performance planning and evaluation is the most important job of the supervisor."

Technical training is another area in which improved strategies can lead to reduced human resource shortages. The trend is toward a recognition of the need to develop integrated training systems and facilities that allow departments of transportation to meet existing skills requirements across functional activities while anticipating future needs. Technical training requires attention to the qualifications, training needs, and opportunities of all employees. Most organizations, therefore, have established technical training planning, delivery, and evaluation systems as elements of their overall human resources management strategies. Ongoing technical training and associated support systems are being recognized as rational investments in the future of all departments of transportation. The expanded use of programmed instruction; interactive computer-based learning technology; in-house training video production; and cooperative training ventures with other state and local agencies, community colleges, and the like are only a few of the ways in which technical training is being developed and utilized as an upgrading tool.

Texas has responded well to the increased need for technical training. In 1981, the Personnel Division changed into the Human Resources Division. It started with a staff of 3 located in the main office and has since grown to a staff of more than 37 with a separate training facility.

Training is not the only area that is growing and developing to meet the human resources challenge. Because of the higher-than-normal retirement rate experienced by and predicted for many departments of transportation, and the ensuing vacancies, many organizations are emphasizing management development programs intended primarily to aid professional engineers in acquiring managerial and supervisory skills. Although highly qualified in their areas of expertise, engineers cannot be expected to be effective in managerial roles without the necessary mix of experience and training in such areas as leadership, decision making, communication, supervision, and administration of personnel procedures. Programs are being developed in many states to provide such training.

Management courses in Texas use an adjunct instructor system to provide students with instructors who have hands-on experience in the specific areas in which they teach. Qualified and experienced individuals in each management area are chosen from the ranks of the department and taken through a train-the-trainer program. The instructors then prepare their own course outlines and materials and teach for 18 months. The system has been found to be effective in the 4 years since its inception. Because of their field experience, the instructors have credibility, and many useful and practical management skills have been taught and learned.

A second area of management development is executive development. To prepare mid-level managers for vacated positions involving executive responsibilities, several states have implemented programs designed to accelerate the acquisition of the administrative skills, knowledge, and abilities required of executive-level personnel.

By now, it should be clear that on the whole, departments of transportation are restructuring and reorganizing training with people in mind, because employees are their most important resource. With that realization has come a new emphasis on career development. Internship and traineeship programs

have been designed in several states to accelerate familiarization with the functions, technical activities, and managerial responsibilities inherent in departments of transportation. Internships allow low-cost access to useful skills and are an effective recruiting tool. Traineeships, on the other hand, involve planned rotation of duty assignments of current employees, which broadens their skills base and enhances their career development. Both types of programs are beneficial, because they provide necessary training yet allow each employee to be productive.

State departments of transportation are also recognizing that the development of their human resources cannot be left to the voluntary and largely individual efforts of their employees. The old approach was to neglect the career concept in favor of a position-oriented approach. That approach is being replaced by the concept of a series of career ladders leading from entry-level positions to middle- and higher-level technical and managerial responsibilities. Therefore, programs utilizing career counseling sessions, new employee orientation, formal and informal training, and quality circles (among other things) are being initiated to encourage employees not only to be effective at their current positions but also to think and plan ahead for skills at other levels and areas of interest.

Job rotation and cross training are two of the final areas of growth in response to predicted shortages. Job rotation is primarily used to familiarize personnel with mainline orga-

nizational functions and activities. The experience will help the employees make informed long-term career plans.

Cross training is used to provide the agency with technical personnel who can work in a variety of activities. It improves the agency's ability to shift its task and goal structures without disruptive turnover or performance "lags" while the agency restaffs to handle new challenges. The adjunct instructor program in Texas mentioned earlier is one example of effective cross training.

Effective training, innovative recruiting, forecasting and planning, and management development strategies—these are the areas covered in the study and this overview. They are more than buzzwords; they are the law if state departments of transportation are to meet the challenges of the coming years. The challenges come not only from the government or the people; they come from within. Work forces must be upgraded and human resources developed, because they are not only the future, they are the present as well.

REFERENCE

1. T. H. Poister, L. G. Nigro, and R. Bush. *NCHRP Synthesis of Highway Practice 163: Innovative Strategies to Upgrade Personnel in State Transportation Departments*. TRB, National Research Council, Washington, D.C., 1990, 35 pp.