

National Cooperative Highway Research Program

NCHRP Synthesis 188

**Management Training and
Development Programs**

A Synthesis of Highway Practice

**Transportation Research Board
National Research Council**

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National Cooperative Highway Research Program

Synthesis of Highway Practice 188

Management Training and Development Programs

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Subject Areas
Planning and
Administration

Systematic, well-designed research provides the most effective approach to the solution of many problems facing highway administrators and engineers. Often, highway problems are of local interest and can best be studied by highway departments individually or in cooperation with their state universities and others. However, the accelerating growth of highway transportation develops increasingly complex problems of wide interest to highway authorities. These problems are best studied through a coordinated program of cooperative research.

In recognition of these needs, the highway administrators of the American Association of State Highway and Transportation Officials initiated in 1962 an objective national highway research program employing modern scientific techniques. This program is supported on a continuing basis by funds from participating member states of the Association and it receives the full cooperation and support of the Federal Highway Administration, United States Department of Transportation.

The Transportation Research Board of the National Research Council was requested by the Association to administer the research program because of the Board's recognized objectivity and understanding of modern research practices. The Board is uniquely suited for this purpose as it maintains an extensive committee structure from which authorities on any highway transportation subject may be drawn; it possesses avenues of communications and cooperation with federal, state, and local governmental agencies, universities, and industry; its relationship to the National Research Council is an insurance of objectivity; it maintains a full-time research correlation staff of specialists in highway transportation matters to bring the findings of research directly to those who are in a position to use them.

The program is developed on the basis of research needs identified by chief administrators of the highway and transportation departments and by committees of AASHTO. Each year, specific areas of research needs to be included in the program are proposed to the National Research Council and the Board by the American Association of State Highway and Transportation Officials. Research projects to fulfill these needs are defined by the Board, and qualified research agencies are selected from those that have submitted proposals. Administration and surveillance of research contracts are the responsibilities of the National Research Council and the Transportation Research Board.

The needs for highway research are many, and the National Cooperative Highway Research Program can make significant contributions to the solution of highway transportation problems of mutual concern to many responsible groups. The program, however, is intended to complement rather than to substitute for or duplicate other highway research programs.

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The members of the technical committee selected to monitor this project and to review this report were chosen for recognized scholarly competence and with due consideration for the balance of disciplines appropriate to the project. The opinions and conclusions expressed or implied are those of the research agency that performed the research, and, while they have been accepted as appropriate by the technical committee, they are not necessarily those of the Transportation Research Board, the National Research Council, the American Association of State Highway and Transportation Officials, or the Federal Highway Administration of the U.S. Department of Transportation.

Each report is reviewed and accepted for publication by the technical committee according to procedures established and monitored by the Transportation Research Board Executive Committee and the Governing Board of the National Research Council.

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PREFACE

A vast storehouse of information exists on nearly every subject of concern to highway administrators and engineers. Much of this information has resulted from both research and the successful application of solutions to the problems faced by practitioners in their daily work. Because previously there has been no systematic means for compiling such useful information and making it available to the entire highway community, the American Association of State Highway and Transportation Officials has, through the mechanism of the National Cooperative Highway Research Program, authorized the Transportation Research Board to undertake a continuing project to search out and synthesize useful knowledge from all available sources and to prepare documented reports on current practices in the subject areas of concern.

This synthesis series reports on various practices, making specific recommendations where appropriate but without the detailed directions usually found in handbooks or design manuals. Nonetheless, these documents can serve similar purposes, for each is a compendium of the best knowledge available on those measures found to be the most successful in resolving specific problems. The extent to which these reports are useful will be tempered by the user's knowledge and experience in the particular problem area.

FOREWORD

*By Staff
Transportation
Research Board*

This synthesis will be of interest to administrators, human resource managers, technical managers, and those who develop training courses for departments of transportation (DOTs). It describes the management philosophies that support the management training and development programs, such as the need for effective leadership, customer service as a primary mission, increased workforce productivity, employee involvement, teamwork for more effective results, and the need for a systems perspective by management.

Administrators, engineers, and researchers are continually faced with highway problems on which much information exists, either in the form of reports or in terms of undocumented experience and practice. Unfortunately, this information often is scattered and unevaluated, and, as a consequence, in seeking solutions, full information on what has been learned about a problem frequently is not assembled. Costly research findings may go unused, valuable experience may be overlooked, and full consideration may not be given to available practices for solving or alleviating the problem. In an effort to correct this situation, a continuing NCHRP project, carried out by the Transportation Research Board as the research agency, has the objective of reporting on common highway problems and synthesizing available information. The synthesis reports from this endeavor constitute an NCHRP publication series in which various forms of relevant information are assembled into single, concise documents pertaining to specific highway problems or sets of closely related problems.

Major issues, including the increasing nonengineering functions within DOTs, the aging and diversity of the workforce, recruitment of entry level professionals, employee retention, and the use of contract services are discussed. This report of the Transportation Research Board examines the types of management and development training courses

that are considered important by state departments of transportation, costs of training, types of participants, topics that are covered, needs for transportation-related courses vs. administrative training, and the development of courses within the DOT. Suggestions for future management training objectives are also presented.

To develop this synthesis in a comprehensive manner and to ensure inclusion of significant knowledge, the Board analyzed available information assembled from numerous sources, including a large number of state highway and transportation departments. A topic panel of experts in the subject area was established to guide the researcher in organizing and evaluating the collected data, and to review the final synthesis report.

This synthesis is an immediately useful document that records practices that were acceptable within the limitations of the knowledge available at the time of its preparation. As the processes of advancement continue, new knowledge can be expected to be added to that now at hand.

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MANAGEMENT TRAINING AND DEVELOPMENT PROGRAMS

SUMMARY

The demand for a competent and credible transportation workforce has never been greater. The 1950s and 1960s saw the bulk of this nation's largest public works effort: the construction of the interstate system of highways. The challenge of maintaining and enhancing that system unquestionably demands the best expertise and the best management the transportation profession has ever had available.

For many years state highway agencies and departments of transportation (DOTs) have been asking the question "Who will lead in the coming decade?" Producing excellent managers for this task has never been easy, but talented candidates have been available throughout the years. Today, answering the question of who will be the future managers, however, is more difficult because of a number of critical factors affecting the workforce. These factors are reducing the numbers and availability of candidates and are changing the profile of those individuals who will fill the supervisory and management ranks of state and provincial transportation agencies in the 1990s.

The most critical factor of concern regarding this issue of developing tomorrow's managers is the aging of highway engineering managers and senior professionals. Retirements are siphoning talent and experience from the top and middle ranks of transportation agencies.

Replacements will be needed for the high numbers of management retirees, but these are not the only additional management and supervisory talent needed. It is reasonable to conclude that most of those promoted to replace the retired middle and senior managers will be taken from the next lower ranks of management and supervisory or professional personnel. When estimated conservatively, retirement of a senior manager can generate promotions to management and supervisory levels of four to five people. In organizations with more levels of management the movement of professional staff into management and into positions of greater management responsibility is increased for every senior or upper middle manager who leaves the department. Viewing the upward shift of personnel shows that as the top levels retire, personnel development is needed in nearly every management level of the transportation agency.

Management training and development programs are seen as a primary means to prepare DOT employees to accept the management challenge of the future. The synthesis examines three major items currently important to transportation agencies. The synthesis first discusses the management philosophies that support the type and content of management training and development programs. These philosophies deal with the need for effective leadership, customer service as a primary mission, increased workforce productivity, employee involvement, teamwork that produces more effective results, and for managers to develop a systems perspective—a perspective of the whole. The synthesis then de-

scribes critical issues affecting the training and development activities in DOTs. The issues discussed are:

- Increase of nonengineering functions within DOTs;
- Aging and diversity of the workforce;
- Recruitment of entry level professionals;
- Retention of employees; and
- Use of contracted services.

The remaining portion of the synthesis explores the options available to DOTs for management training and development as well as the programs currently in use, both nationally and by selected DOTs. The specific options examined are:

- Internally and externally developed courses taught by agency or contractors;
- State courses taught by state or contracted trainers;
- Contracted courses (private sector offerings);
- Video, audio cassette, and video-satellite courses;
- Standard university courses and courses geared for agency management;
- University undergraduate and graduate degree programs;
- Transportation management and management executive institutes;
- Federal Highway Administration/National Highway Institute courses; and
- Management rotation opportunities.

A survey of transportation agency management training and development activities was conducted to provide data for the synthesis. Data were gathered on the topics and types of management training and development programs as well as on a number of current workforce trends seen in the DOTs. In general it was found that:

- Transportation departments employ on the average about one person in five who performs some supervisory or management responsibility.
- Most agencies do not have readily available data about the cost of training or development efforts for this significant portion of the workforce.
- About 50 percent of the agencies saw management training or development opportunities decreased or deferred during the last 5 years, many of the agencies considered fiscal or budgetary constraints as the primary reason for the decrease or deferral. Only a few agencies saw increases in management training or development opportunities.
- Typically, managers themselves initiate the request for training.
- Senior managers rated transportation management courses and externally developed courses as the preferred types of training. Furthermore, management training is seen as beneficial to senior managers within DOTs, but is not a primary activity.
- Middle managers and first-line managers preferred internally developed courses. These managers receive training and development that is more closely tied to the specific DOT or to more technical and administrative topics. This high priority for internally developed training reflects the trend to incorporate specific DOT philosophies, culture, policy, and procedures into a management group training effort.
- It is desirable for every level of manager to be trained in communications skills.

- Leadership skills training and development becomes more important as the level of management rises.
- Teamwork training and development is more important for middle and first-line managers than for senior managers.
- Training in strategic management is a high priority for senior managers and of considerably less importance to middle managers and of even less to first-line managers.
- Decision-making and problem-solving training and development are important priorities for all levels of managers, although somewhat less so for first-line managers.
- Training in technical skills and personnel management are more important for first-line managers and middle managers.
- Training and development of managers in the area of employee retention received a moderately low priority rating for all managers.
- Workforce diversity training and development received a low to medium priority rating for all levels of management.
- Marketing training and development is considered the least valuable topic.

Details on management training and development programs and courses were received in conjunction with the survey. Interviews with DOT training staff as well as representatives from the American Association of State Highway and Transportation Officials (AASHTO), the Highway Users Federation for Safety and Mobility (HUFSA), and other management training professionals also provided substantive material for program examples, which include program descriptions and course outlines. The items presented are among the best representative public sector sponsored programs and courses available to DOTs.

A number of DOTs have ambitious management training and development courses. However, many DOTs are just beginning to implement management training programs for all levels of management. DOTs are beginning to position themselves to have an adequate supply of trained managers for the future. A new awareness of the importance of employee recruitment and retention coupled with management training and development efforts will be needed to effectively manage the 21st century transportation workforce.

INTRODUCTION

This introduction defines the problem of meeting the need for management training and development programs in state and provincial transportation agencies. First is a discussion of the requirements for competent leadership and the broad factors affecting the supply of talent to manage and lead transportation departments into the 21st century and beyond. Next is a short background description defining the context in which the problem occurs. Chapters Two and Three examine these issues in greater detail. The remainder of this chapter defines the objectives and scope of the synthesis and briefly discusses the data sources.

DEFINITION OF THE PROBLEM

The human resource is the most critical component of an organization's ability to accomplish its goals. Only skilled and motivated transportation professionals can lead the industry into the 21st century. (1)

As the 21st century approaches, transportation agencies are examining their organization's ability to function effectively in what will be a vastly different work environment. Agencies are right to investigate their preparedness to lead. Many, if not all, are aggressively equipping their personnel to manage the requirements and workforce of the 1990s and beyond.

The demand for a competent and credible transportation workforce has never been greater. The 1950s and 1960s saw the bulk of this nation's largest public works effort: the construction of the interstate system of highways. Yet the challenge of maintaining and enhancing that system unquestionably demands the best talent the transportation profession has ever had available.

Responsibilities and workloads continue to grow. Operational objectives in state and provincial transportation agencies have increased as technology and knowledge have increased. Every state agency acknowledges producing more comprehensive transportation services today than in the past and producing them in a more efficient and cost-effective manner. (2) Not only are transportation services being expanded, but well-publicized opinions link the investment in infrastructure with national economic health, encouraging even greater investment. (3)

For many years, transportation agencies have been asking the question "Who will lead in the coming decade?" Producing excellent managers has never been easy, but talented candidates have been available throughout the years. Answering that question today, however, is more difficult because of three critical factors affecting the workforce. These factors are reducing the number and availability of candidates and are changing the profile of those individuals who will fill the supervisory and management ranks of state and provincial transportation agencies in the 1990s.

The most critical factor is the aging of highway engineering management and senior professionals. Retirements are siphoning talent and experience from the top and middle ranks of transporta-

tion departments. As noted in a special report of the Transportation Research Board, "Greater-than-average turnover is expected among the most senior professionals. Approximately one-third of the professional engineers in state and county transportation departments will retire [in the 10 years from 1985 to 1995.] This is far greater than past retirement trends." (4) Because senior and middle management positions will be vacated, others qualified to take on these management positions will be required.

Replacements will be needed for the high numbers of management retirees, but they are not the only additional management and supervisory talent needed. It is reasonable to conclude that most of those promoted to replace the retired middle and senior managers will be taken from the next lower ranks of management and from supervisory or professional personnel. When estimated conservatively, retirement of a senior manager can generate promotions to management and supervisory levels of four to five people. In organizations with more levels of management, the movement of professional staff into management and into positions of greater management responsibility is increased for every senior or upper middle manager who leaves the department. Viewing the upward shift of personnel shows that as the top levels retire, personnel development is needed at nearly every management level of the transportation agency. This model, the upward movement of talented employees, is a standard progression of management succession within a hierarchically structured organization such as a DOT. This model is not unique, but the large number of retirements within a relatively short timeframe is quite unique for the transportation public sector.

Unprecedented numbers of experienced managers have reached or are approaching retirement age. At the same time, the composition, size, and very nature of the next generation is changing, which is a second critical factor affecting future management. The workforce is continuing to shift from predominantly white males to a more diverse composition that includes many more women and minorities. Moreover, the educated workforce of this decade and the next will decrease in size, creating greater competition for the most capable employees. (5) This new cadre of professionals carry with them different values, lifestyles, and goals. Preparing management to lead this workforce adds complexities to the existing system which has been instituted to train management successors.

The third major factor currently affecting transportation departments' management succession is the recessionary economic climate of the late 1980s and early 1990s. The lack of strong financial commitments and no-growth or downsized budgets affect management development and training opportunities. In many agencies, funds normally dedicated to programs that prepare technical staff for management and to increasing existing managers' skills are being cut back. Not only does the lack of funds decrease the development opportunities, but it also tends to cause agencies to delay hiring staff. Attrition becomes an opportunity to save money,

although it increases the loss of candidates for promotions to management positions. Other effects of lower funding are manifested in across-the-board reductions in force, contracting out services that had been performed by agency staff, and privatizing whole segments of transportation functions.

These three major factors—(1) unprecedented number of retirements of the most experienced managers and staff; (2) the potentially decreasing numbers and changing requirements and composition of the upcoming talent; and (3) the recessionary environment generating fewer funds for attracting, retaining, and developing management employees—create concern about the proper succession of management and leadership within transportation departments today. The question foremost in many minds—What is being done through training and development to help alleviate that concern?—is addressed in this synthesis.

Background

The majority of state and provincial transportation agencies have existed since the early 20th century. The genesis of these agencies more often than for any other reason was getting the newly popularized automobile “out of the mud” by road building. From their earliest times the predecessors of today’s departments of transportation had a technical foundation in highway engineering and today still concentrate in providing services for the highway mode. The professionals in the agencies were and continue to be predominantly civil engineers. As can be expected, the education and training in civil engineering or other engineering disciplines was perhaps a written or unwritten requirement, but none-the-less an influential factor governing those who would rise to the supervisory and management ranks within an agency.

The professional workforce, and especially the subset from which management employees would emerge, was a remarkably homogeneous group. Traditionally, the management and supervisory personnel as well as the majority of professionals in a transportation agency were white males. Additionally, some agencies maintained long-standing relationships with universities that specifically prepare students to enter the highway industry in general and the state highway agency in particular. With employees coming from the same educational institution, it is easy to understand the similarities among the staff engineers. Further, agencies give hiring preference to individuals with military service. Likewise, management practice continues to advance those individuals who “fit in” with the culture and values of the agency. Management practice also encourages “on the job” training with junior staff learning from senior staff members. Often the mentor and coach relationships, formed by affinity, continue the traditional profile of the “typical” employee from one generation to another. These and other institutional conventions promoted the homogeneity of the highway community workforce.

Engineering education has not customarily included management skills training. Engineering curricula simply have not included management courses or allowed time to take them as electives. Because many engineers who are now in supervisory and management positions in transportation agencies were educated in technical disciplines only, it is reasonable to conclude that many were employed by the agency without having had much, if any, formalized management training.

Although many engineers did not come to their agencies with an understanding of management principles, often this was not

critical because most began in entry-level technical positions. Realizing that employees would need to continue to learn as they performed their functions, transportation agencies increasingly recognized the importance of training and staff development. In 1951, a progress report on state highway personnel practices said

[T]here has been a transition from acceptance of the idea of staff training as an agency function to active use of training as an effective aid. Ideas appear to be changing from specialized training . . . to the point where there are appearances of a practical and orderly plan for the systematic development of the skill, knowledge and ability of all personnel. (6)

Not long thereafter AASHTO began providing management training.

DOTs recognized the necessity of the systematic development of management personnel as well as of technical professional. Although training was available, many engineers in transportation departments were promoted because of superior technical abilities. These exceptional technical employees were at times ill-equipped to deal with the management responsibilities of their new positions. These managers succeeded by learning on a day-to-day basis. However, that process takes a long time to develop managerial skills and does not necessarily provide for consistency in learning or accountability for a manager’s progress.

The mission of transportation agencies must also be considered. The broad mission of most agencies is the safe, efficient, and cost-effective construction, maintenance, and operation of transportation systems. Training and development is not the main mission, although having a qualified staff to accomplish the mission is essential. During times of tight budgets and extraordinarily heavy workloads in the past, training and development of staff were considered a background activity or a function that could be deferred. However, with the present economic challenges, training has emerged as an integral part of the strategic mission of many agencies.

Over the years, the transportation agency has been a stable environment for a career. It is not uncommon for those who are now retiring to have been with their departments for all or the majority of their professional careers. A 35-year management employee retiring at age 60 or 65 could have earned an undergraduate degree, perhaps received a master’s degree, or served in the military for a number of years. The agency could easily have been the individual’s only civilian employer. Stable employment and the opportunity to build on one’s successes within the same organization for a full career has been an attraction for many transportation professionals.

Not only are those who are at the end of their careers retiring, but many other younger employees are being offered incentives for early retirement. Often these employees are hired by consulting engineers and contractors who perform work for the agencies from which the employees retired. Because these managers and senior professionals are leaving the transportation agency at the height of their productive years, there is a drain on management skills and technical expertise from many transportation agencies.

Transportation departments are often considered to provide less compensation than employers in the private sector. Because it was generally understood that the private sector compensates management employees better than the public sector, new data were not collected for this synthesis to compare public and private sector compensation and benefits. However, examining management compensation over a number of years for Fortune 1000 companies

confirmed the general impression. A 1988 AASHTO survey of member departments on recruitment and retention also confirmed that departments are losing engineers to the private sector because of the higher private sector pay scales. (6)

Since the 1980s, however, many say change is the only thing that is predictable. But it is important to remember the origins and past practices of agencies when considering current practices and future outlook. Chapter Two examines transportation agencies in light of a number of current management philosophies and practices. Chapter Three deals with issues affecting management training and development programs. A number of the items discussed in these two chapters have their basis in traditions and standards established in past years. Options used by state DOTs are presented in Chapter Four. Chapter Five presents some examples of both national and state programs.

OBJECTIVES AND SCOPE

The objective of this synthesis is to provide an overview of the training and development activities of transportation agencies in the United States and Canada. The synthesis describes some of the primary means these agencies use to prepare employees to take on increased supervisory and managerial responsibilities and so provide for management succession and leadership in the years to come.

Although the title of the synthesis directs the focus to management training and development programs in transportation agencies, the scope is considerably broader. In addition to presenting examples of notable programs, the synthesis includes discussions

of issues that form the contextual framework, in which the management training and development programs are conducted. To build this framework the synthesis examines some of the more prevalent management philosophies and practices of DOTs. It also presents a number of operational, organizational, and workforce issues which have influenced or currently affect the DOTs' management training and development programs.

This synthesis is an addition to a series prepared during the last 7 to 8 years. Training and education of highway and transportation professionals have been of great interest especially since 1985 when the Transportation Research Board produced *Special Report 207*, (4) dealing with the future needs and opportunities of transportation professionals. Closely following that document was *Special Report 210*, the proceedings of the Conference on Surface Transportation Education and Training. (1) Since these publications appeared, a number of other documents have discussed various aspects of the preparedness of transportation agency personnel to address the changing workforce and organizational issues of this decade and the next. The *NCHRP Synthesis of Highway Practice 163: Innovative Strategies for Upgrading Personnel in State Transportation Departments*, (8) complement this synthesis. Review of that synthesis will add to the usefulness of this document.

The primary concerns that were the basis for development of *Synthesis 163* and much of the other existing work center on two principal areas: (1) recruiting and retaining well-qualified personnel for transportation agencies, and (2) ensuring that there is a sufficient pool of knowledgeable employees to supervise, manage, and lead the agencies in the future. As stated broadly above, this synthesis addresses topics dealing with the second point of concern.

CHAPTER TWO

DOT MANAGEMENT PHILOSOPHIES AND THEIR TIES TO MANAGEMENT TRAINING AND DEVELOPMENT TOPICS

CURRENT MANAGEMENT PHILOSOPHIES

Every manager and supervisor has a set of philosophies used daily in the practice of management. Many popular private sector management philosophies are particularly well received by public sector organizations. Several of the philosophies are staples of management theory; although the concepts may not be new, there is a renewed emphasis on them. Several others are just gaining a foothold in transportation departments and are being adopted readily.

Based on an extensive literature review and inspection of DOT management course material, a group of these philosophies emerges as being especially influential and in broad use throughout the state DOTs. A brief description of these philosophies follows. Where appropriate, implications of organizational or management change attributable to adopting these philosophies are mentioned. The next section, Impact of Changing Management Philosophies, further explores the impact of these changes on state and provincial transportation agencies.

Provide Leadership so Others Will Follow

Today's managers and supervisors must not only possess the ability to manage projects and resources, but also to lead people. The recent realization of the importance of leadership has its roots, like many other management philosophies, in the private sector. Economic leadership for the United States became critical as a number of industrialized nations advanced to challenge the U.S. position of leadership. Suddenly the interest in maintaining a leadership position was top priority for the nation as well as its manufacturing and service communities. The desire for continuing economic leadership quickly translated into a number of management philosophies dealing with personal leadership, quality, and productivity.

DOTs readily adopted the philosophy that personnel must be given a vision and an agenda to follow. Past wisdom encouraged moving from administration to management: planning, directing, and controlling. Today the ability to administer and manage are expected, and now the emphasis is on personal characteristics that will cause people to follow or be led. In a recent study (9), superior leaders were determined to have the following ten characteristics:

- | | |
|--------------------|--------------------|
| 1. Honest | 6. Fair-minded |
| 2. Competent | 7. Broad-minded |
| 3. Forward-looking | 8. Courageous |
| 4. Inspiring | 9. Straightforward |
| 5. Intelligent | 10. Imaginative. |

The philosophy of developing this kind of individual as the man-

ager or supervisor has in many cases transformed management attitudes and practice. The philosophy encourages development of skills that are considered more relational, i.e., people-oriented, and employees are responding well.

Management skills requiring excellence in relating to or dealing with people, such as communications, team building, coaching, and counseling, have come to the forefront of today's management training circles. These relational skills are significantly more intangible than what training and development efforts have focused on in the past. Instilling these qualities in today's transportation professional will be more difficult than developing more quantitative skills. Additionally, measurement of success for training and development programs dealing with some of these relational skills will be more difficult.

The importance of promoting a leadership-oriented philosophy is indicated in the survey performed for this synthesis. Leadership was considered the top-priority training topic for senior managers and the number three priority for middle managers and first-line supervisors. These priorities are discussed further under Topics for Management Development and Training.

Serving Customers Is a Primary Mission

Providing an excellent transportation system and services to the citizens of the state or province is a high-priority mission objective of many DOTs. This philosophy has been popular within DOTs for most of the last decade. Gaining a better understanding that the citizen is the primary beneficiary of DOT's work has been revolutionary. In some cases, this philosophy has been incorporated into organizational values and culture. This attitude has shifted the focus from solely perpetuating the organization's function to pride in delivering the best service possible. (10)

Much of the service philosophy originated from quality management theory. Many DOTs have not only adopted service as a primary goal, but continuous improvement in that service as well. Nearly every DOT that responded to the survey mentioned some type of quality training program. The various quality programs, including total quality management are among the major efforts within DOTs that focus on the customer, whether that customer is internal to the organization or a citizen/user.

The result of the practice of the service/quality philosophy is a better product. Most DOTs have not yet reached the full potential of their quality efforts and will require more time to permanently change their cultures so that quality becomes second nature. Although programs are not fully implemented, many DOTs are seriously pursuing implementation. These organizations (1) realize there is a fundamental revolution in mission—they are no longer technically directed organizations but are now service organizations, (2) are keeping their customers satisfied (the first priority),

and (3) are continually seeking improvements to the mature transportation system that they operate.

Improvement in Workforce Productivity

Closely associated with quality is productivity. The often echoed refrain is "do more with less." DOTs are being forced to be more productive for a number of reasons. The most obvious is expanded responsibilities accompanied by significant reductions in funding or no-growth budgets. One seemingly positive outcome has been a more productive workforce.

Because fewer dollars are available, stronger emphasis is now placed on properly qualified personnel performing the right job at the right time. The implications of this philosophy are that the workforce must be appropriately staffed, must be adequately trained, and must maintain excellent skills.

The fiscal crisis initially may have promoted productivity, but as survey respondents indicate, it also may be the cause for falling productivity. As fiscal shortages continue, attrition and staff cut-backs may result in understaffed organizations and undertrained personnel. Of the synthesis survey respondents, 50 percent said that training and development budgets were inadequate, and based on their professional judgment, an average budget increase of 58 percent was needed. These organizations see a number of reasons for more training, and without adequate training and development, productivity will suffer.

Employee Involvement Increases Commitment to the Mission

A number of programs have been instituted within DOTs to elicit employee's ideas for improving management procedures. Whether these programs are based on participatory management principles, such as quality circles, or other employee involvement mechanisms, many DOTs are pushing the decision-making process downward, away from senior management.

Broadening the circle of decision makers is a relatively new concept for DOTs that have traditional hierarchical organizational structures. In the past, more authoritarian models of management were the norm. This change takes advantage of the more relational characteristics of the workforce and is producing large dividends: problems are more readily being solved at levels where they occur; employees are accepting ownership of their responsibilities and consequently of the whole organization; commitment and pride in accomplishments are more visible.

Teamwork Produces More Effective Results

While DOTs have used task forces and special project teams for years, the philosophy that endorses the effectiveness of teamwork and team players is enjoying a resurgence in management circles, including those at DOTs. As Parker noted, "Organizations are discovering that . . . teams are the route to increased productivity, a more effective use of resources, cost reduction, improved quality, innovation, [and] better customer service. . . ." (11)

Because teamwork and team playing embody many of the management philosophies DOTs use, it is understandable that teamwork received a high rating in the survey. When respondents were

asked to prioritize the topics in order of importance for training and development programs, teamwork ranked number 5 for senior managers and number 2 for middle managers and first-line supervisors. The characteristics of effective teams and their team players as defined by Parker (11) are as follows:

- Clear sense of purpose
- Informal climate
- Participation
- Open communication
- Clear roles and work assignments
- Shared leadership
- Listening
- Civilized disagreement
- Consensus
- External relations
- Style diversity
- Self-assessment.

With the renewed interest in the philosophies surrounding teams and team playing, more extensive application of the concepts are being encouraged. Instead of special projects being the primary domain of teams, as in the past, transportation agencies now are beginning to involve the full organization.

Successful Managers and Organizations Have a Perspective of the Whole

Success has many components. One is the ability to grasp the whole—to think and operate with a perspective of the whole system. Over the years, this skill has been important, but training and education have concentrated on specialization and compartmentalization. Concerns are increasing that specialized people and tasks are not all that organizations need. In fact, the practice of dividing a problem or an organization into ever smaller parts in order to manage better seems to have reached its zenith. The additional skill, which many managers possess, but one that needs strengthening, is systems thinking—a more holistic approach to managing people and the organization.

The more advanced a technical education is, the more focused on one area it becomes. Many of today's scientists and engineers are very well trained in one aspect of a whole discipline. To become an expert in an area, such specialization is necessary. Many of today's transportation experts become supervisors and managers, often because of their expertise in a certain technical discipline, not because they are experts in management. Understanding that managers may have limited views of the transportation whole may have prompted the current emphasis on grasping the big picture. A systems approach to managing is desirable, and the manager who has this view has an advantage.

Systems thinking is also being applied to organizational policies. More and more life issues, such as kin-care (care for children and elderly), health care, and housing locations are becoming the concern of the organization as well as the individual. DOTs are being required to take a more holistic view of their employees, particularly in their efforts to recruit and retain staff.

IMPACT OF CHANGING MANAGEMENT PHILOSOPHIES

Transportation agencies are undergoing change, although viewing day-to-day operations may not reveal these changes. The philosophies just discussed affect agencies to their very core. The agency of 10 years from now will be substantially different in a number of ways, yet familiar in others. The philosophies put into

practice today will take time to produce results. However, those in practice for several years at many DOTs, as are most of those discussed previously, are starting to change the way organizations behave and accomplish their missions.

The practice of a new management philosophy in an organization essentially is an effort to change operations by changing the culture. The newer management philosophies currently practiced in DOTs have produced cultural changes—quality as an organizational characteristic, increased commitment of employees through increased organizational involvement, and others. As anticipated, the cultural changes in DOTs have brought operational changes—increased productivity, for example, in the form of better trained employees performing more efficiently or the active development of leaders to carry on the mission.

The absolute necessity to change or improve the culture in DOTs is responsive to the economic and societal forces operating upon the organizations. DOTs are, for the most part, dealing well with the difficult demands placed on them by the economy and society. The changed management philosophies have changed the DOT culture, which in turn has improved operations. These improved operations are positive responses to today's transportation needs.

DOTs benefit from changing management philosophies. Yet they must constantly strive for change—for improvement—for to keep pace with economic and societal demands.

One area that deserves particular attention is the workforce. Management philosophies must change to prepare for anticipated changes in the workforce of the future. Retirements and a number of current workforce practices are precursors of even more workforce change. Significant workforce issues are still developing within DOTs and management philosophies to deal with them are still emerging. These workforce issues will be dealt with in Chapter Three.

Topics for Management Training and Development

DOTs' current management philosophies are directly related to the emphasis on specific management training and development topics. It is reasonable to expect that leaders of an organization promote the philosophies and principles by which they operate. One major vehicle these leaders use is training and development programs. Within DOTs, it is not uncommon for the full management team to be trained in a topic of strategic importance to the organization. For example, a number of the agencies surveyed promote enhanced communications skills for the full organization and especially for all managers and supervisors.

When asked if the agency has a strategic basis for which personnel are trained, 65 percent of the agencies responding to the survey for this synthesis said yes. A majority of the respondent agencies stated that top management or some form of high-level committee within the organization was the decision maker for the training and development activities that are conducted. Several agencies emphasized individual needs assessment as their primary method for determining what training or development is necessary. However, even at these agencies, the topics for training fit into some strategic decision-making process.

Of the agencies responding to the survey, 35 percent **required** a specific training curriculum or program for managers. The percentage jumped to more than 75 percent when agencies that **suggest** as well as **require** specific curricula or programs are included.

The strong direction from top management is certainly indicative

of the lessons those top leaders want the rest of the organization to adopt. Both of the above statistics reinforce the concept that management philosophy is strongly promoted through the training and development activities within DOTs.

The survey also asked training directors to rate the priority of training and development topics for three levels of managers within the agency:

1. **Senior managers** are those who manage supervisors or other managers and who are responsible for a major function of the agency.
2. **Middle managers** are those who manage supervisors or other managers.
3. **First-line supervisors/managers** are those having first-level management responsibility; those who manage only professional or technical employees.

Table One shows the management training and development topics the agencies were asked to rate.

The survey requested information for each of the three levels to accommodate any differences in training and development strategies for the different levels of responsibility. For several of the top-rated topics, the differences in the point ratings were small. The full list of topics for each level of manager is shown in Figures 1, 2, and 3.

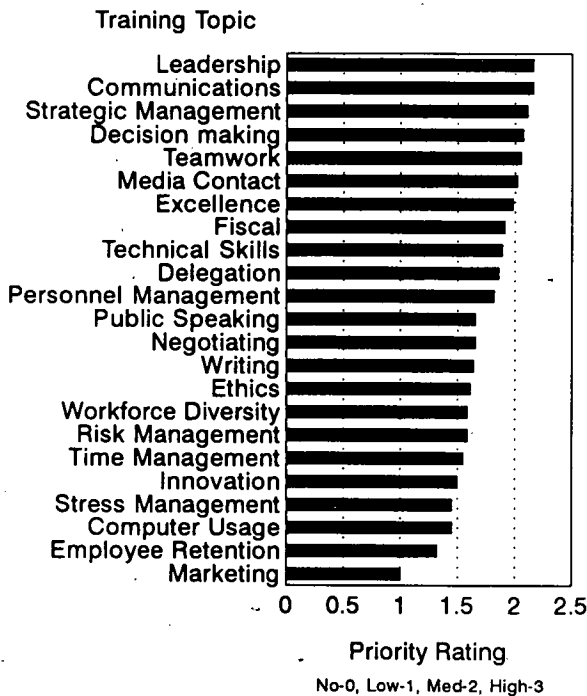
The priorities given to the top five topics show the major concerns for training and development efforts within the majority of the departments surveyed. Based on the priority ratings, the following observations can be made about the importance of the different training and development topics for different levels of management.

- It is desirable for every level of manager to be trained in communications skills.
- The higher the level of manager, the more important is leadership skills training and development.
- Teamwork training and development is more important for middle and first-line managers than for senior managers.
- Training in strategic management is a high priority for senior managers, of considerably less importance to middle managers, and of even less importance to first-line managers.
- Decision-making and problem-solving training and development is an important priority for all levels of manager, but somewhat less important for first-line managers.
- Training in technical skills and personnel management is more important for first-line managers and middle managers.
- Marketing training and development is considered the least valuable topic.
- Training and development of managers in the area of employee retention received a moderately low priority for all three levels of managers; the topic was second from the bottom in order of importance for senior and middle managers.
- Workforce diversity training and development received a low-to medium-priority rating for all levels of management.

Examining the survey data gives some information about training and development topics important to DOTs. It is reasonable to expect that the higher the priority of a topic the more important it is for the manager to develop the skill. The lower the priority, the less important the skill may be to the level of management or the individual may be expected to have already developed that

TABLE ONE
MANAGEMENT TRAINING AND DEVELOPMENT TOPICS

Fiscal/Financial	Communications
Computer Usage	Ethics
Workforce Diversity	Time Management
Leadership	Stress Management
Employee Retention	Teamwork
Marketing	Delegation
Negotiating Skills	Innovation and Entrepreneurship
Writing	Excellence/Quality
Public Speaking	Liability/Risk Management
Media/Press Contact	Strategic Management
Decisionmaking/Problem solving	Professional Technical Skills
Personnel Management	

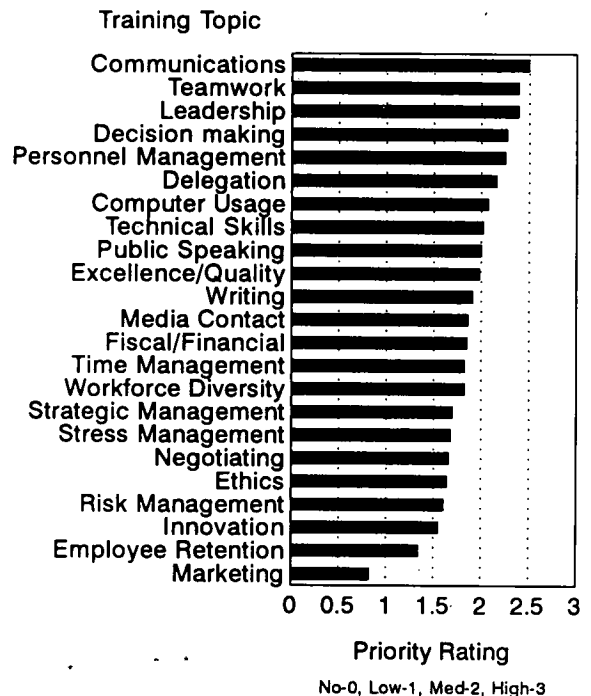


44 Respondents

FIGURE 1 Training & Development Topics, Priorities for Senior Managers.

skill. For example, computer usage skills training is considered important for first-line and middle managers, but much less important for senior managers. The senior manager either is not expected to use computers to the extent the lower level managers are, or the senior manager may be expected to have developed sufficient computer skills by the time the senior position has been reached.

Considering the concern about workforce issues in general, two workforce topics were rated lower than what may have been expected: workforce diversity and employee retention. If indeed as *Workforce 2000* (4) predicts, the workforce will be more diverse



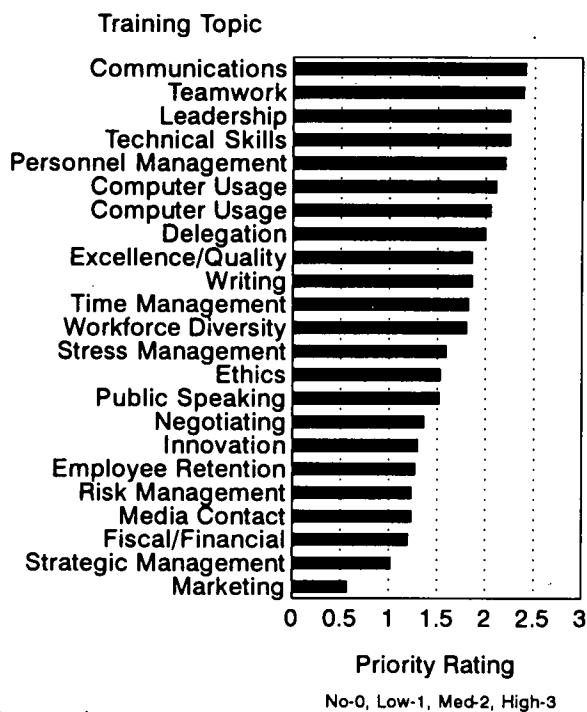
44 Respondents

FIGURE 2 Training & Development Topics, Priorities for Middle Managers.

in the coming decade and the professional workforce will be smaller, then perhaps more emphasis on these two topics for training and developing managers will be necessary.

The survey asked the training directors to rate the given topics and also asked for other topics of importance. Additional topics, mentioned by one agency each except conflict resolution, which was mentioned twice, were as follows:

- Workforce literacy (low priority for all management levels)



44 Respondents

FIGURE 3 Training & Development Topics, Priorities for First-line Managers.

- Conflict resolution/management (high priority for all levels of management)
- Managing change (high priority for all levels of management)
- Productivity and motivation (high priority for all levels of management).

The answers and all general comments given on the survey do

not project an immediate concern for managing change. It may be that managers are aware of change, but the topic is not considered a broadly accepted area for training and development. Although these four items were not rated by all agencies, they are good additions to the topical list.

Trends in Priority Topics

The survey asked for training directors' opinions on the topics of greatest concern 5 years ago, currently, and 3 years in the future. This question was asked to get a better understanding of where the agencies thought training and development efforts had been, how they were progressing and where these efforts may go in a few years. Results of the survey are shown in Table Two.

Several observations about the responses are informative. Leadership will continue to be a topic of importance, although it is losing its top rating to workforce diversity and human resource issues. This shows that DOTs are aware of the progressing workforce diversity changes. It may also indicate an increased awareness of the relationship of training and development to recruitment, retention, and management succession issues.

Computer usage and information technology, which was less important 5 years ago, has a high priority today, but may slip in importance in the near future. A possible explanation for this is that in a few years, current employees will have been trained. In addition, newly hired employees may be expected to have considerably more enhanced computer skills than those who are hired today.

Priority topics for future years indicate a need for strategic management and planning accompanied by increased productivity and continued tight funding. The environment for which the training directors are preparing appears to be equally or more fiscally constrained than today's environment.

The future also brings new priorities for training in ethics and teamwork/teambuilding. Some of the concern for these areas may be based on the reputed different or unknown values of the next generation of workers. Further discussion of trends regarding younger professional employees is in Chapter Three under Retention of Employees.

TABLE TWO
TOPICS OF GREATEST CONCERN TO TRAINING DIRECTORS

5 Years Ago (1986)

1. Leadership
 2. Professional Technical Skills
 3. Communications
 4. Personnel Management; Computer Usage (Same rating)
 5. Time Management
-

Current (1991)

1. Leadership; Workforce Diversity and similar issues, including sexual harrassment (Same rating)
 2. Computer Usage
 3. Fiscal/Financial issues
 4. Communications; Professional Technical Skills (Same rating)
 5. Strategic Management/Planning
-

3 Years in the Future (1994)

1. Workforce Diversity and related human resource issues
2. Strategic Management/Planning
3. Excellence/Quality
4. Leadership
5. Fiscal/Financial issues
6. Computer usage and information technology; Ethics; Innovation/Entrepreneurship (Same rating)
7. Teamwork/Teambuilding

Number 1 was clearly rated highest; numbers 2-4 were closely grouped, indicating a second tier of concerns; numbers 5-7 were closely rated indicating a third tier of concern.

CHAPTER THREE

WORKFORCE ISSUES AFFECTING MANAGEMENT TRAINING AND DEVELOPMENT PROGRAMS IN DOTs

In addition to management philosophies and topics of focus, other issues directly affect training and development activities: transportation funding levels, the change in highway mission from “build” to “repair and maintain”, the workforce, and others. The most important issues are those dealing with the workforce. This chapter discusses several workforce issues that have an impact on training and development programs in DOTs: the increase of non-engineering functions, the aging and more diverse workforce, employee retention, recruitment of entry-level professionals, and contracted services.

Increase of Non-Engineering Functions Within DOTs

There are two sources of the increase in non-engineering functions within DOTs: (1) the broadening of the organization’s mission to incorporate modes other than highway and (2) the expansion of services and expertise required within the highway area. State and provincial agencies began as highway organizations. Over time most made a transition to multimodal transportation agencies that resulted in consolidated transportation functions through incorporating other modal areas that were growing in size and importance.

Today most transportation departments include offices or divisions covering transit, rail, air, and water modes. Line organizations for these modes exist within the agencies and most often are operated in parallel with the original highway organization. The diversification of talent in the additional modes is beneficial to the department. The overall technical and professional skills of the organization are increased.

Although some departments may own and operate transit, rail, or air facilities, many of the facilities in these other modes are not owned or operated by the DOT. The DOT is, however, often responsible for directing federal or state funding to the service providers for safety inspections and enforcement, auditing, planning, and other similar functions. Many of these functions are staffed by experts in non-engineering disciplines. The complex nature of a DOT today requires financial, economic, legal, and administrative skills required not only of the technical and professional staff, but also of the managers. No longer are the most senior managers of the department only senior highway engineers. Frequently, the chief administrative officer (CAO) is an attorney or a person who has a financial, planning, or some business-related background.

In addition to broadening its mission and increasing its complexity, the highway mode is expanding beyond its traditional bounds. Today highway organizations are staffed with community relations experts, environmental experts, attorneys, public administrators, computer experts, economists, scientists, planners, and a host of other non-engineering specialists.

Highway organizations are also increasing the engineering-related responsibilities of the professional staff. With higher levels of training, technicians now perform some of the tasks that were formerly assigned to professional engineers. This trend has its origins in the quest for a more productive workforce as well as the growing shortage of engineering talent found in some departments as a result of high retirement rates. TRB *Special Report 207*, which discusses the future needs and opportunities of transportation professionals concludes that, “enhanced use of technicians within state departments of transportation appears likely during the coming decade. To some extent, this can help meet the bulge in demand for skills arising from the large numbers of engineers retiring. It is also a probable outgrowth of increased application of more automated techniques.” (4)

The training directors in more than 35 percent of the agencies surveyed noted an increase in candidates who are not engineers applying for management positions. Initially, some of the educational experiences that these non-engineers bring with them are management based. Employees with finance, economics, law, or public administration backgrounds are very likely to have had management coursework at the undergraduate or graduate level. What then is the effect of management training and development programs within a transportation department? Training for some of these employees may need to emphasize management of public organizations rather than private. Efforts will be needed to develop similar management skills to those for engineering employees being prepared for management positions.

The employee without an engineering background will also be required to understand the engineering side of the operations. The topics survey respondents gave priority to for training and development programs included areas seen as typically management-related, but technical skills were a significant priority as well. Several comments from survey respondents support the idea of the continued need for training for all management personnel:

- Increased requests for specialized technical training,
- Increased training in computer and financial skills, and
- Increased awareness by engineers of their need for management skill training.

It is important to note that today’s transportation department may have a number of executives who are not engineers, such as deputies for planning, safety, administration, specific mode (transit, rail, air, water) technology, and motor vehicles plus the highway (engineering-oriented) deputy. In addition, the chief administrative officer may not be an engineer. This suggests one further concern. Although these other functions exist, the DOT is still predominantly staffed by employees performing highway services, implying a concentration of engineering skills. Will there be sufficiently challenging senior management opportunities to retain the

TABLE THREE
AGE DISTRIBUTION OF MANAGEMENT-LEVEL
ENGINEERS IN STATE HIGHWAY AGENCIES

Age	Percent
Less than 26	0.03
26-35	4.9
36-45	29.5
46-55	41.2
56-60	18.6
61-65	5.3
over 65	0.5

engineers needed in the organization? Traditionally, many of the senior managers were engineers turned planner or administrator. Today and in the future, these positions may be filled with experts in the specific discipline. The increase of non-engineering positions benefits the DOT by increasing the talent pool, yet critical engineering skills should not suffer because of the addition of other disciplines.

Aging of the Workforce

The retirement of a generation of transportation professionals, many of whom are today's leaders—the mid-level and senior managers within transportation departments, presages a vastly different workforce as the 21st century approaches. This will result in the need to prepare younger employees to take over these leadership positions.

DOTs have a technical foundation in highway engineering and most, if not all, concentrate on providing services for the highway mode. A large percentage of management-level professionals in state DOTs began their careers in the late 1950s and 1960s as a result of the country's focus on a national system of interstate highways. The late 1980s and 1990s are the retirement years for those professionals who entered the workforce as a result of this extensive highway engineering effort. Table Three contains the age distribution of management-level engineers in DOTs and shows the potential for a large percentage of retirements during this decade.

Many engineers and others associated with the highway industry built bright careers within highway and transportation departments since the early interstate program initiative. TRB *Special Report 207* stated that "60 percent of the nation's management-level engineers in state agencies will be eligible to retire within 5 years . . . [and] attrition due to retirement as well as other causes will amount to 13.5 percent of management engineers" during this same time. (4) Informal discussions today with state agencies confirm this prediction, and it appears to be, in some cases, quite conservative. *American City and County* magazine stated that 12 or more states will have lost 25 percent or more of their employees by 1989. (12) The article continued by stating that by 1989 Florida, South Carolina, and Iowa would have retirement rates for senior professionals of between 35 and 41 percent. These retirements include significant numbers of senior and middle-level managers.

Recent budget shortfalls and other economic problems popular-

ized early retirement programs in the DOTs. Incentives for retirement often have caused employees to leave their positions sooner than normally expected. Furthermore, early retirements have become a vehicle for expediting attrition or easing the reduction-in-force requirements resulting from significantly smaller budgets. Now in the early 1990s, highly experienced management-level employees are leaving DOTs in unprecedented numbers. Age and financial factors are encouraging these retirements.

Retirements affect management training and development activities in two significant ways. As described above, senior employees' retirements deplete the composite knowledge and experience of the existing workforce. Those replacing the retirees may need to enhance their technical skills through training and education simply to fill the knowledge gap. These employees, by definition, have less professional experience and in some cases significantly less management experience. Retirement of a senior manager in a state or provincial transportation department can create management level promotions for four to five people when estimated conservatively. In organizations with more levels of management, the movement of professional staff into management and into positions of greater management responsibility is increased. Because the replacements are required at accelerated rates, training and development should be expected to occur at accelerated rates.

Workforce Diversity

Several well-publicized documents were written within the last 5 years predicting a dramatic change in the composition of the professional workforce in the next decade and the early 21st century. These include *Workforce 2000 (5)* which stated:

The workforce will grow slowly, becoming older, more female, and more disadvantaged; and . . . new jobs in the service industries will demand much higher skill levels than the jobs of today.

The report also stated that

Demographic changes will mean that the new workers entering the workforce [until] the year 2000 will be much different from those who people it today. Non-whites, women, and immigrants will make up more than five-sixths of the net additions to the workforce . . . though they make up only half of it today.

Another report, *Megatrends 2000 (13)*, stated that in the coming decade and beyond, women will continue to take two-thirds of the new jobs created in the information and service sectors. It also quoted the American Association of Engineering Societies as saying that as of 1989 women earned 13 times more engineering degrees than in 1975.

These predictions are for the private sector, but workforce demographic changes will occur in the public sector as well. It is not yet clear whether there will be more pronounced changes or whether the time frame will be the same for the public sector. The more diverse workforce will be evident in the pool of workers from which the DOTs will draw entry-level professionals and more senior replacement talent not available within the agencies. *Civil Service 2000 (14)* prepared for the U.S. Office of Personnel Management, takes into consideration that the labor pool for professionals is growing more slowly than in the past 50 years or more. The report states that for federal employees, few engineers and information science employees will be hired as replacements espe-

cially for more senior-level employees and managers because salary and benefit scales are below those in the private sector. For this same reason, DOTs also may expect to have increased difficulty in hiring experienced professionals. Training and development of the existing agency workforce becomes more critical in this environment. Agencies will need to concentrate more heavily on the development of managers in addition to increasing technical skills. The emphasis on investing in and development of "home-grown" management and leadership is a very positive organizational behavior. Stronger emphasis by DOT top managers on professional development efforts can turn a potential management succession problem into an influential factor for retaining employees.

Because there is an even greater potential to train and develop managers from within the department, the public sector workforce may diversify more slowly than the private sector's. It appears that the majority of women, minorities, and immigrants will enter the workforce at the most junior levels. If these entries occur during the 1990s, training for current managers to bring the best out in a more diverse workforce should be starting now and in the very near future. Managers need to be prepared for any subtle changes that diversity will bring to the skill of management. For the most part, however, a more diverse workforce should not have a dramatic effect on the types and content of management training and development programs within DOTs. Instructional techniques may differ, but many of the qualities desired in a manager will be the same for a number of years to come.

Recruitment of Entry-Level Professionals

Recruitment of entry-level professionals is an important issue when considering training and development programs for management succession within state and provincial DOTs. Traditionally, employees began in entry-level positions at the highway agency and over the course of a full career developed into senior managers. However, times are changing: with "the workforce growing more slowly than at any time since the 1930s," (5) the labor pool will be smaller and competition will increase for the brightest and best educated.

As has been discussed in many publications dealing with recruitment within DOTs and the public sector in general, state and provincial agencies must be more innovative and invest more effort and resources in attracting and then retaining entry-level employees. This is undoubtedly a complex problem. Clearly defined management training and development opportunities may be helpful to draw in new employees, but salary, benefits, quality of life issues, challenge of the position, personal goals, and other factors are more influential at the time of hiring.

Although the source of managers has been and is likely to continue to be the entry-level employee, a dilemma still exists. How will a sufficient pool of employees be created from which to develop managers for every level of the organization? Recruitment is important, but retention of excellent employees is critical.

Retention of Employees

Training and development programs that continually invest in the employee and provide clear paths to advancement and increased management opportunities are of greater importance for retaining employees than recruiting them. Management training

and development opportunities can be of great advantage in the multiapproach methods used to retain employees. It is important to note that training and development are only one part of the puzzle. Other opportunities, such as rotational assignments, especially early in an individual's career, are influential factors for employee retention. Management training and development may not be sufficient for retaining employees, but it is most probably a necessary criterion.

For employees who want to be managers, development opportunities are necessary. *Megatrends* mentioned a survey from *Success* magazine that questioned young employees. "Loyalty [to the organization] was important—but never as important as personal growth." The authors of *Megatrends* concluded that "the new workforce will help achieve [organizational] objectives if it can achieve its own personal goals as part of the bargain."

Further insight about the workforce of the 1990s comes from authors of the book, *Managing Workforce 2000*. (15) They reported results of a survey conducted to determine the most important values that motivated people. They concluded that the following list was significant for today's workforce:

- Recognition for accomplishments
- Respect and dignity
- Personal choice and freedom
- Involvement at work
- Pride in one's work
- Lifestyle quality
- Financial security
- Self-development
- Health and wellness.

Training and development programs certainly address the self-development motivator. Clearly a number of the other issues do not fall within the training and development area, but many of them are useful to note what managers should know when performing their management duties.

When DOT training directors were asked about trends they saw among entry-level or newly hired management employees, they provided information that may give some insight to issues surrounding employee retention.

Of 46 responses, the following indicates the number of DOTs that saw these trends in their agencies.

Number of Responses	Trend
<u>27</u>	Loyalty to organization being replaced by concern for personal growth in career
<u>23</u>	More reluctance to relocate because of a promotion
<u>20</u>	Increased emphasis given to leisure time
<u>17</u>	Increase in candidates without engineering training applying for management positions
<u>13</u>	More educated management employees have more options open to them for career moves
<u>5</u>	Increased requests for leaves of absence for elder care or other similar family reasons

Other emerging trends seen among first-line (entry-level) or newly hired management employees were:

- Increased awareness by engineers of their need for management skills training
- Increased requests for specialized training
- More emphasis on professional development opportunities.

The continuing challenge for transportation departments is to find the balance between accomplishing their missions and allowing employees to achieve personal goals. A further challenge is to recruit employees who have goals that can be fulfilled within the transportation agency mission. The fewer unfulfilled expectations, the more potential for employee stability and the less turnover within the organization.

Management training and development programs affect employee retention much in the same way they affect workforce diversity. Initially, managers must be trained to get the new workforce to perform to its best ability—whether that new worker is from a different background or of a younger generation with different values. Secondly, the management training and development programs must be in place to challenge and encourage excellence and a desire to assume greater management responsibilities and leadership roles.

CONTRACTED SERVICES

The practice of hiring contractors and consultants to perform operations and maintenance work that routinely had been done by transportation department employees has become more popular in the last decade. Contracted services for highway operations can impact the agencies' management and development activities. This is the modal area where the greatest amounts of DOT funds are spent for contracted services. Other modal areas within DOTs frequently use the same kinds of procedures as the highway administrators. This discussion, although directed toward highway practices, may also be relevant to contracting for engineering and technical services for transit, rail, water, or air projects. Other syntheses in the NCHRP series discuss contracted services in significantly greater detail than the treatment of the management training and development aspect of the topic contained herein.

Use of Consultants and Contractors

Transportation departments use consultants and contractors for a considerable portion of their routine work. *NCHRP Synthesis 137: Negotiating and Contracting for Professional Engineering Services (16)*, noted that of the annual state and federal expenditures on contracts for design and construction inspection, 12 states accounted for 60 percent of the expenditure, and that most states participated in this practice to some degree. In another of the series of synthesis, *NCHRP Synthesis 125: Maintenance Activities Accomplished by Contract, (17)* 71 out of 75 state, provincial, and local transportation agencies surveyed used contract maintenance. Those represent several major areas where contracting is popular, but many other projects or functions are also under contract, ranging from research to project management. (18)

From a review of the literature regarding contracting, there do not seem to be data proving that the addition of contracted services allowed the federal-aid highway program to increase significantly after passage of the 1982 Surface Transportation Assistance Act. There is good indication that the expansion was in part accomplished because of the added expertise of the private sector highway community. It is reasonable to conclude that states not only choose to contract for services, but also rely on the expertise of the private sector to accomplish the agencies' missions.

Opinions differ significantly regarding various aspects of con-

tracted services: the cost of contracted services compared to the cost of full-time employees performing the service, the value of possessing the expertise in-house versus purchasing the expertise, the loss of immediate control of the contracted project, and other similar contracting-related issues. For the purpose of this synthesis, it is sufficient to acknowledge that DOTs do indeed contract for significant amounts of private sector consultant and contractor services. It is also appropriate to note that the expertise of the private sector is valuable to agencies and of particular importance to the agencies that contract for a great amount of services.

For the agencies that contract a significant portion of any task, project, or function, a question emerges. Who inside the organization has sufficient knowledge to determine whether the contracted service is being performed properly? Even the experts who ensure quality work may be contract personnel. In these situations, the role of continuing technical training and development for senior professionals and managers is critical. The skills needed are not only technically oriented, but many are project and program management skills that incorporate traditional management topics. Therefore, organizations that rely on contracted services need to be particularly observant of the technical and management skill level of their professional employees.

Competency of Contract Personnel

Because the private sector highway community supplies significant services to DOTs, it is sensible for DOTs to require that consultant and contractor personnel are adequately trained and competent to provide the service requested. When asked in the synthesis survey about determining contractor training adequacy, 65 percent of the respondents reported their agencies had specific means to determine if the contractor had adequately trained employees. Most of the remaining agencies stated that contractor competency was not emphasized at the time. That answer may imply those agencies do not perform significant amounts of contracted work or that contractor training is not a concern of the training division within those DOTs. Often the consultant/contractor selection duties are quite separate from those of the training personnel. Although this separation of duties can exist, the training directors provided interesting information about the preferred types of courses and how the consultants and contractors can participate in agency or federal-level training.

The primary source for determining contractor competency is the review of contractor organization and individual employee credentials and qualifications. The more responsibility the contractor personnel are to assume, the more detailed qualifications might be expected. These qualifications take the form of resumes, job descriptions, and other similar information sources. *NCHRP Synthesis 146: Use of Consultants for Construction Engineering and Inspection, (19)* reproduced copies of Standard Forms 254 and 255 developed by the United States government. Many states use these standard documents to ascertain the qualifications of professional engineering, architectural, and construction firms. Form 255 asks for a brief resume of key staff persons assigned to the project. In addition to supplying written material about key staff, project leaders, and managers, personal interviews before the award of the contract are not uncommon. Additionally, if the contract to be awarded is a federal-aid-funded engineering or design contract, the state must abide by approved state or standard federal regulations. These regulations stipulate that the award must be negotiated

on the basis of demonstrated qualifications and competence among other items.

Many DOTs require specific certifications for contractor technical personnel assigned to agency projects. Professional engineering registrations and technical certifications from the National Institute for Certification in Engineering Technologies are well accepted. DOTs also award their own certifications to contractor personnel. Regardless of the certification process, the standards are high. As reported in *NCHRP Synthesis 146*, "In general, agencies require somewhat higher qualifications for consultant engineers than for their own staff," and "most states compared the resumes of technicians against their own personnel classification plans to evaluate qualifications." (19)

The survey for this synthesis asked if the agency provided opportunities for its consultants and contractors to participate in agency-sponsored training and development programs. Seventeen agencies (37 percent) said they allowed or encouraged participation in (1) their own sponsored programs and (2) courses sponsored by the Federal Highway Administration (FHWA)/National Highway Institute (NHI). Eighteen agencies (39 percent) provided opportunity for one or the other option. One agency, Wyoming's, reported that it does joint training with the Associated General Contractors.

Workshops, seminars, and conferences were the primary vehicles for training and development of the consultants and contractors. Michigan developed a seminar and teambuilding activity for construction project contractors, and states have conducted courses containing technical and administrative material especially directed to disadvantaged business enterprises.

Responses to the survey question, "How are the consultants and contractors chosen for participation in DOT training courses?," can be grouped into a few general answers:

- Announcements of training and development opportunities are sent either to all agency consultants and contractors or a specific list of consultants and contractors is prepared based on the type of project or the amount of work the outside organization is performing for the agency.
- One-fourth of the respondents have no specific criteria for attendance, but consultants and contractors are accepted on a first come, first served basis.

- A number of agencies require the outside organization to pay its own fees; in general, acceptance to courses or seminars is based on space availability and on technical need.
- Several agencies rely on the outside organizations' requests to participate, and one agency, Ontario's, accepts nominations from consultant/contractor groups and associations that are representative industry stakeholders in the transportation system.
- Florida relies on departmental rules and regulations that specifically address consultant/contractor training.

Although many agencies encourage consultants and contractors to be trained even through the agency's training and development efforts, the contracted organizations are expected to be fully qualified in the tasks they are to perform. Many consulting engineering organizations pay particular attention to the technical and management qualifications of their employees. One such private sector company stated

[Our organization] budgets approximately 1¼ percent of its annual revenues for formal training. This is probably not adequate. We understand that the Big Eight accounting firms in the United States budget about 10 percent of their annual revenues for training . . . the engineering profession is recognizing that a greater training commitment is needed and that growing organizations must develop formal engineering management training programs. (20)

Nevertheless, there is little consistency from one organization to another. *NCHRP Synthesis 146*, in the discussion of construction engineering and inspection training, makes several recommendations about consultant/contractor personnel qualification criteria, encouraging a more universal application of the standard qualification forms (Standard Forms 254 and 255) mentioned in this section. That synthesis also recommends that "Consultants should take the responsibility for ensuring that their employees are trained rather than leaving it up to the employees or the agencies."

Essentially, management training and development activities should be focused on DOT employees; however, when a specific need occurs and space is available, DOTs will allow outside organizations to participate. The proper balance is needed so that agency personnel are trained appropriately and that agencies receive excellent services from contractors.

CHAPTER FOUR

OPTIONS USED BY DOTs FOR MANAGEMENT TRAINING AND DEVELOPMENT

DOT PROFILE DATA

A representative group of DOTs was reviewed to determine the magnitude of the training and development effort being considered for this synthesis. Transportation departments employ on the average about one person in five to perform some supervisory or management responsibility. Further examination of survey data from the majority of respondents shows that of these employees:

- 71 percent are first-line supervisors/managers—those who manage only professional or technical employees;
- 23 percent are middle managers—those who manage supervisors or other managers; and
- 6 percent are senior managers—those who manage supervisors or other managers and who are responsible for a major function of the agency.

Most agencies do not have readily available data about the cost of training and development efforts for this significant portion of the workforce. Only about half of the agencies responding to the survey supplied the total amount of agency expenditures for management training. Of those agencies responding, costs ranged from \$15,000 for a small agency to \$2 million for a large agency for annual management training and development expenditures. A few agencies gave specific information about the cost of training per employee:

- Colorado averaged \$225 per employee for the 200 first-line supervisors it trained, \$1,765 per employee for 75 middle managers; and \$5,000 for one senior manager.
- Wyoming estimated it spent \$1,000 per employee for its first-line supervisors and middle managers and \$2,000 per employee for its senior managers.

Only four out of 46 agencies responding to the survey reported having a guideline or objective regarding the training dollars spent per individual. Massachusetts uses a percentage of the department operating budget and Washington state uses an informal target of between 1 and 2 percent of annual work hours, 20 to 40 hours of training annually.

About 50 percent of the agencies saw management training or development opportunities decreased or deferred during the last 5 years, and a number of these agencies indicated that these decreases or deferrals were unacceptable. Sixteen agencies (more than 70 percent) considered fiscal or budgetary constraints to be a reason for the decrease or deferral. About one-quarter of the agencies have either restrictions on travel or on consultant hiring (including training consultants), which reduces the access to training opportunities. With budget cuts, there is less consultant training in New York state, but this agency is reshaping training to rely on agency staff trainers. Florida is downsizing the workforce and

is concentrating on production demands rather than training; California scaled back management training in favor of required technical training.

Only a few DOTs mentioned an increase in management training and development activities. Washington state and British Columbia are increasing training, the first because of an increased emphasis on training by senior managers and the second to assist in a major organizational restructuring. A number of agencies' comments showed concern about the need for increased management training and development activities within their agencies. Tight financial controls and cost/benefit statistics that can be presented to top management might be a key to expanded training opportunities.

Time is always a concern for managers. Training and development programs may not be the manager's top priority considering the workload of most managers. When the training directors were asked how managers in their agencies find appropriate time to avail themselves of the training and development programs offered to them, the following general responses were given:

- Training is a high priority, attendance is fully self-initiated, positive attitudes are the norm;
- Top management provides encouragement; top managers give personal attention to all other managers;
- Some training and development is done on personal time;
- Managers work more hours and delegate work while out of the office for training;
- Attendance is not an option, it is required;
- The programs are of such quality that the demand is high, time is not the issue;
- Seminars and workshops are scheduled realizing the time constraints of the managers;
- Time still remains a problem; and
- Training budget is downsized, time for scheduling has not been a problem.

Additional information expanding on these points is in Appendix B, Survey Summary, question 9.

When training and development is needed or desired, it is interesting to note that most often managers themselves initiate the process to get the training or to take advantage of a development opportunity. The following shows the most common ways in which a manager is referred to training:

Number of Responses	Referral Type
32	self referral
23	directed by performance appraisal
21	agency development plan (10 agencies used all three above)
25	directed by management or supervisor

TABLE FOUR
TYPES OF MANAGEMENT TRAINING AND DEVELOPMENT

- Internally developed courses taught by agency or contractors
- Externally developed courses taught by agency or contracted trainers (i.e., courses developed for agency managers)
- State courses taught by state or contracted trainers
- Contracted courses (private sector offerings)
- Video or audio cassette courses
- Video/satellite training courses
- University courses geared for agency management
- Standard university courses
- University undergraduate degree programs
- University graduate degree programs
- Transportation management/executive institutes
- Management/executive institutes
- Federal Highway Administration/National Highway Institute courses
- Management rotation opportunities

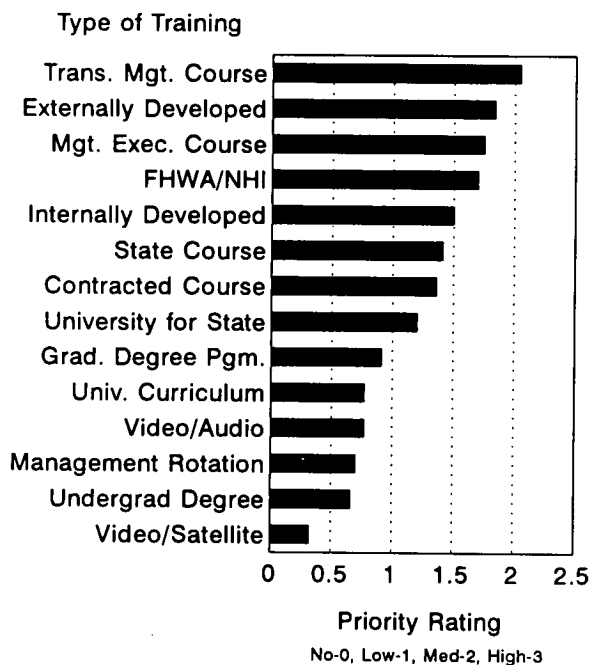
The data about the training organizations and the way they operate are informative when considered in conjunction with the options the agencies have to accomplish training and development.

Options for Training and Development

Transportation departments have a number of options available to them to train and develop professional employees to take on increased management responsibilities. The options can be formalized structured courses, informal employee self-studies or coaching relationships. Formal types of training and development include internally developed, agency-taught courses, video/satellite training, university degree programs, management institutes, and many more. States provide tuition reimbursement most often in areas of technical expertise that relate to specific employee responsibilities, as well as participate in programs that accrue university credits or continuing educational units (CEU, a program of the National Task Force on the Continuing Education Unit). The survey conducted for this synthesis asked for priority ratings of the different formalized types. The rating method is similar to that used for the various training and development topics discussed in Chapter Two. The types of training that the survey respondents were asked to rate are listed in Table Four.

The survey asked training directors to prioritize the types of training and development for the three levels of managers within the agency. The levels are senior manager, middle manager, and first-line manager. These are the same groupings used in the discussion on management training and development topics in Chapter Two.

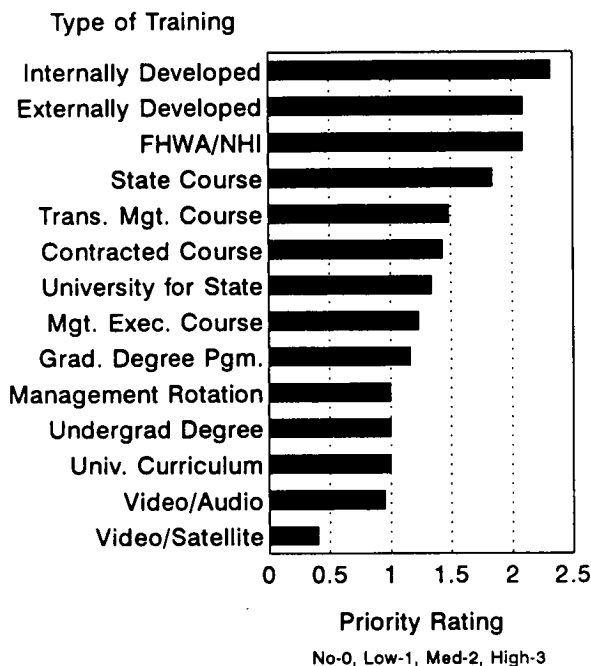
By reviewing Figures 4, 5, and 6, the average priority ratings for the three levels of managers, a few general observations can be made about the types of training and development opportunities DOT managers receive. Senior manager training emphasizes management courses. The types ranked first and third are transportation management and management executive courses. These courses, however, are only of medium priority for the middle managers. A conclusion is that, in general, management training is seen as



44 Respondents

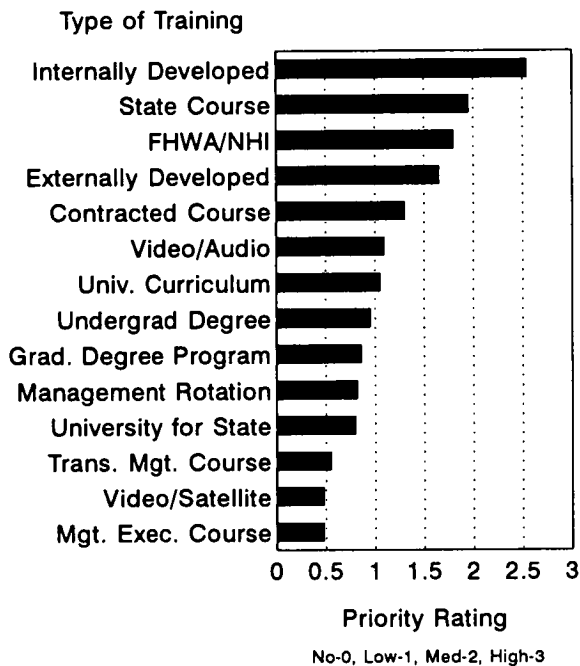
FIGURE 4 Types of Training & Development, Priorities for Senior Managers.

beneficial to the senior managers within DOTs, but it is not a primary activity as are courses developed outside the DOT. These courses may be management or technical in nature. Of lesser priority are types of training that are potentially administrative or technical, such as the FHWA National Highway Institute (NHI) courses, internally developed courses, and courses conducted by the state or province. Contracted courses are a relatively low priority for senior managers, and lower still are university-sponsored education



44 Respondents

FIGURE 5 Types of Training & Development, Priorities for Middle Managers.



44 Respondents

FIGURE 6 Types of Training & Development, Priorities for First-line Managers.

and training activities. It is a low priority for senior managers to work on graduate or undergraduate degrees, management rotation is not particularly perceived as a priority, and technology-based training and development (video/audio courses, satellite training) is not very popular or simply may not be available. Through information gathered in interviews for the synthesis, one potential discrepancy in this data may be regarding the senior manager's use of audio cassette development materials. Often management materials are available through the department library, not the training professionals. More frequently, managers may go directly to the source for the cassettes, the DOT library or publisher, rather than go through the training office.

Middle managers receive training and development that is more closely tied to the specific DOT or to more technical and administrative types of opportunities than senior managers. Internally developed training is of higher priority than other types of activities. Many DOTs have developed management curricula for middle managers. The general costs of conducting the courses are significantly lower in part because they are held locally and development costs are lower, the management material is uniquely tailored for the attendees, and technical transportation information can be integrated into the management presentations. The tendency to conduct internally or externally developed courses using skilled department personnel as instructors is increasing. Some of the change from contracted training may be due to the tightened budgets within DOTs. Using department experts can be considerably less expensive than using consultants. The use of a staff trainer often produces more direct control over the development opportunity, and perhaps gives greater potential to train more middle managers and first-line managers as well. Further in line with this practice, only as a medium- to low-priority do middle managers take formal transportation management courses. Management executive development is of lower priority for these employees than for more senior-level employees. Overall, university-conducted or sponsored activities are of higher priority than for senior managers. For both senior and first-line manager ratings, university training and education fall in the second half of preferred development opportunities.

Internally developed activities are of medium to high priority and are the first choice for training and development for first-line managers. Internally developed activities for first-line managers are also the highest average priority given for any type of management training and development. For first-line managers, the priority for internally developed courses is just about 30 percent higher than the next rated activity. This reflects the recent concentration of many DOTs on preparing the professional employee to take on new management responsibilities. Many departments have written their own first-line manager courses. The courses contain introductory management principles and administration topics of concern to this level of management and present them all in the context of the specific work environment.

These internally developed courses are considered important for first-line managers or supervisors because for many technically educated employees and those without a high level of education, the courses could be the first management training ever received. Furthermore, these training and development opportunities are the first management-level exposure to department values and culture. An essential lesson the first-line managers learn is how to transfer to the employees they supervise the cultural attributes of the organization. Additionally, in keeping with the individual employee's desire for self-improvement and to reinforce the commitment of

the organization to the individual, this very specialized training is a notable ingredient in the complex process of retaining excellent employees.

The next highest rated type, state courses, are important for first-line managers, as for middle managers, because these courses provide background and information regarding the whole public administrative arena. FHWA/NHI courses rated high for all managers, having about a medium priority in each instance. NHI courses are almost exclusively concerned with technical topics. As seen in the survey results, DOTs consider technical skills training important for all levels of managers. NHI courses are often used to prevent obsolescence of technical skills and to keep pace with new or improved technical subjects. After the top four rated types of training and development for first-line managers, priority for the remaining types drops significantly.

Other types of more formalized training and development opportunities were listed by the survey respondents:

- Task forces
- Conferences
- Assignments to special projects
- Engineer training program
- In-house management certificate program
- Accelerated management program for women
- Acting assignments (temporary performance of duties for vacant position).

The survey also asked whether any particular type of training or development activity was more effective for training management employees. Six types emerged as those considered significantly more effective than others. Interestingly, university participation received some notice, but only when very closely tied with the DOT. The types considered most effective in order of preference are:

- Internally developed courses
- Transportation management institutes; institute joint development with university
- FHWA/NHI
- Externally developed courses taught by others with agency input for course development
- Externally developed courses
- University courses geared for agency management.

The survey also asked about less formal means of developing management talent in the DOTs. Because of the informal nature of these activities, they are often left to the discretion of the employee. Furthermore, some will only work with the employee's initiative. A number of good ideas and methods were suggested and are summarized below with the agency that suggested the activity:

- Discussion groups, readings (New York state)
- Courses offered in the community, such as community college courses and other adult education programs (Alaska, Colorado)
- Self-study manuals, workbooks, computer-based training; (Florida, Indiana, Kansas, Wisconsin)
- Self-development film program (Kansas)
- Agency library resources (Kentucky, Michigan, Minnesota, Pennsylvania)
- One-on-one consultations with trainers (Kentucky)
- Professional association/society memberships (Nebraska)
- On-the-job training; volunteering for task force assignment, job enrichment/enlargement, job reassignment, special projects, serving in an acting capacity in a higher level job (Colorado, New Jersey, Oklahoma, Montana, Virginia)
- Mentoring and coaching (British Columbia, New York state, Texas, and Washington state)
- Friendships and informal networking—particularly powerful ways that women train and cross-train to improve their career options (New Mexico)
- In-house presentations (Pennsylvania, Saskatchewan).

Twenty-six agencies suggested these types of informal training and development opportunities. Not all agencies commented, and it is certain that this listing is incomplete. It does, however, identify some of the more popular informal/self-initiated activities used in management development.

Management literature concludes that retention of employees is often based on the personal involvement of the individual. (See the discussion in Chapter Two, Retention of Employees.) Employees involved in coaching, mentoring, task forces, networking, serving in acting capacities all have a higher potential to remain with the organization.

This chapter presented general information about the options and types of training and development opportunities used by DOTs. The next chapter provides examples of management courses and programs at specific DOTs.

CHAPTER FIVE

PROGRAM EXAMPLES

This chapter highlights specific courses or training modules from a number of public or association-sponsored state agencies and state cosponsored training programs. General information is given about the course or program, followed by a course outline. Individual courses are featured so that the wide variety of excellent courses can be examined. The chapter is divided into two sections, national programs and courses or programs sponsored by state DOTs or other agencies.

The synthesis survey asked respondents to send course materials to show the type of management training and development programs the agencies conducted or recommended. Review of the materials received showed that many agencies made special efforts to develop specific programs or to produce training materials for a unique group of employees. Few agencies had addressed all management levels and all training topics within each level with equally comprehensive efforts. A number of respondent agencies have developed superior courses that warrant mentioning. The items selected for this chapter are presented by course or program rather than discussing the general management training and development activities of the state or province.

For information about overall state efforts, a number of states' programs are discussed in *NCHRP Synthesis 163: Innovative Strategies for Upgrading Personnel in State Transportation Departments*. (8) *Synthesis 163* discussed management development strategies for engineers and others in a number of states, and it reviewed several states' executive development programs.

NATIONAL PROGRAMS

DOTs most often use three organizations that sponsor public sector management training and development programs:

- AASHTO sponsors the Transportation Executive Institute, and the National Highway and Transportation Management Institute,
- The Highway Users Federation for Safety and Mobility (HUFSA) in conjunction with AASHTO sponsors the National Highway and Transportation and Management Conference, and
- FHWA/NHI sponsors a Research Program Management for State Highway Officials, the only predominantly management oriented program it offers.

The management courses sponsored by these organizations are briefly described.

Transportation Executive Institute

The Transportation Executive Institute (TEI) is an AASHTO-sponsored program offered by the Department of Civil Engineering

School of Engineering and Applied Science and the Division of Continuing Education, University of Virginia, and the Virginia Highway and Transportation Research Council. Dr. Lester A. Hoel is principal contact and director of the program. Twenty-nine states and the FHWA have participated in previous institutes. Generally, the TEI is held annually, however, because of funding constraints experienced by many DOTs, the institute was not held in 1991. The TEI is a week-long program, running from Sunday evening through noon Friday. It is tailored to the specific needs of the participants and is given only as the need is confirmed. After the completion of each institute, chief administrative officers (CAOs) are surveyed to determine the demand for future TEI offerings and to get a sense of the current and emerging topics that should be included in any subsequent offerings. Material included in this synthesis was taken from the TEI offering in 1990, because information for the 1992 institute was not available.

The program is directed to the CAO and key deputies of the DOTs. If appropriate, other organizations can participate. A spouses' program is offered at no additional cost to the participants for whom the registration fee is \$2,600. A maximum of 24 people may participate in the institutes, which are conducted at the University of Virginia.

The following brief background and objectives statement that accompanied the 1990 institute agenda is an excellent summary of the offering.

Background: Although modern transportation administrators must deal with a variety of special challenges (i.e., rail, urban transit, trucking, and rural issues), they are not in the spotlight as they deal with rapidly changing issues and often lack the in-depth background needed to identify and evaluate options and advise political leaders on technical issues. They need to be brought quickly up-to-speed in key policy and managerial areas so they can deal with issues as they evolve.

Purpose: The purpose of the institute is to address this need by providing a think tank environment for CAOs and their executive staffs in a university setting that will provide the mechanism whereby current issues can be fully developed, discussed, and debated.

Objectives: The objectives of the institute are:

- To contribute to the understanding of the political, technological, social, legal, and economic forces affecting transportation management;
- To increase understanding of current issues in transportation; and
- To provide a forum for the exchange of ideas and concepts related to transportation.

Topics: The topics in this 1-week program were those considered most important by CAOs based on a poll of the 50 state agencies. Speakers are widely recognized for their knowledge and experience. The theme of the institute is "Managing the State's

TABLE FIVE
TRANSPORTATION EXECUTIVE INSTITUTE PROGRAM SCHEDULE

Transportation Executive Institute Program Schedule, October 14-19, 1990		
Day	Speaker	Topic/Title
Sunday	<ul style="list-style-type: none"> ■ Welcome Reception and Dinner Speaker, Dr. O. A. Gianminy, University of Virginia 	<ul style="list-style-type: none"> ■ Historical Perspectives of the University of Virginia
Monday	<ul style="list-style-type: none"> ■ Dr. Lester A. Hoel, Univ. of VA ■ Dr. Thomas D. Larson, Federal Highway Administrator ■ Dr. Claudia J. Sowa, Univ. of VA 	<ul style="list-style-type: none"> ■ Program Overview, Participant Introductions ■ Strategic Planning in the Public Sector: The National Transportation Policy ■ Managing Executive Stress and the Stressed Executive
Tuesday	<ul style="list-style-type: none"> ■ Dr. Gib Akin, Univ. of VA ■ Col. Edward M. McDonald, Commandant, Defense Information School ■ Evening Program and Speaker 	<ul style="list-style-type: none"> ■ Options to Increase Organizational Efficiency and Employee Productivity ■ Dealing with the Public: Citizens and the Media
Wednesday	<ul style="list-style-type: none"> ■ Robert E. Faris, American Trucking Associations ■ All Participants 	<ul style="list-style-type: none"> ■ Presentations and Participant Discussions of Transportation Experiences, Successes and Concerns ■ Informal Discussions and Recreation ■ Tour of Monticello, Thomas Jefferson's Home
Thursday	<ul style="list-style-type: none"> ■ Dr. Gary R. Allen, VA Research Council ■ Dr. Wilfred Owen, Brookings Institution ■ Evening Program and Speaker 	<ul style="list-style-type: none"> ■ Funding Innovations and Results of Transportation Investments ■ A Look Ahead in Transportation
Friday	<ul style="list-style-type: none"> ■ Dr. Larry J. Sabato, Univ. of VA ■ Dr. Hoel 	<ul style="list-style-type: none"> ■ Governmental Relations at the State and Local Level ■ Program Evaluation and Adjournment

Transportation System in a Changing World." Table Five shows the topics for the offering in October 1990. For additional information about the TEI, refer to *Transportation Research Record 1101* (21) and the January 1985 *AASHTO Quarterly* article describing the program. (22)

The recent AASHTO publication *Survey of Member Departments on AASHTO-Sponsored Management Development Programs* (23) provides additional information about the TEI effort.

More than half of the member departments participated in TEI in 1990, and the executives attending overwhelmingly believed the institute was useful and met training objectives. The executives (1) wanted to keep the number of participants in the institute at its current level, spanning the week timeframe, (2) thought that additional sponsors should be sought to defray expenses if fewer than 20 state participants registered, and (3) said group discussion, problem solving, and case studies were the most effective tools

used at the institute. The survey respondents also indicated that approximately 35-45 participants would be willing to attend each year for the next 5 years.

National Highway and Transportation Management Institute

The National Highway and Transportation Management Institute is sponsored by AASHTO in cooperation with HUFSSAM. Dr. Thomas A. De Coster, Director of Executive Education, School of Public and Environmental Affairs, Indiana University, has directed the program since 1987. The institute was founded in 1967 and accepts a maximum of 40 participants at its 3-week course, which is held at the School of Public and Environmental Affairs, Indiana University. Enrollment is open to all of AASHTO's member departments, its affiliate and associate agencies, and the U.S. Department of Transportation. The program fee in 1990 was \$1,900. It is expected that the employer of the participant will pay the fee as well as salary, living and travel expenses, and any other expenses incurred as a result of attendance.

Participation Requirements:

Personal interest in attending; Bachelor's degree, preferably in civil engineering, public administration, or a related field; minimum of 10 years of wide experience in one or more AASHTO member departments or affiliate or associate agencies, and at least 10 years of anticipated service remaining before retirement; the current CAO or principal deputy of an agency or have demonstrated managerial potential that with further training, will qualify the individual to occupy one of the major administrative positions in the agency; and have not attended the AASHTO/HUFSSAM Management Conference (discussed next) within the last 3 years (suggested, not required).

Attendees are selected from those who occupy high-level positions in engineering, finance, personnel, or administration, among other areas. The institute develops those who must function in engineering oriented organizations and who must also possess managerial skills and abilities.

Purposes: This program is designed to supplement essential engineering capabilities with extensive training in management techniques oriented toward highway and transportation department operations. The course provides a grounding in fundamentals and principles as well as more sophisticated concepts and practices in management of department operations. The material is presented at a graduate level and emphasizes the administrative challenges of today's transportation organizations.

Program Tracks: The five program tracks covered in the National Highway and Transportation Management Institute and their components are shown in Table Six.

Instruction Methods: The overall objective is to involve the participant in the learning process. Teaching and instructional techniques include lecture-discussion, case problem analysis, role-playing, and group and committee work. The 1990 institute incorporated individually videotaped exercises, with separately scheduled debriefings, as well as the preparation of individual implementation plans that mapped out actions to apply the tools and concepts acquired during the course. In addition, the National Institute for Fitness and Sport at Indiana University presented all participants with a physical wellness program, including an extensive outline

of each person's fitness condition. Participation in the fitness module was voluntary.

The AASHTO *Survey* (23) also provides information about the National Highway and Transportation Management Institute course. Within recent years, 35 member departments have sent participants to the institute. Nearly every respondent agency that had attendees at the course reported that it was useful, and more than 80 percent of this group thought that the course met the agencies' training objectives. The respondents also confirmed that offering the course during consecutive weeks was appropriate. About half of the respondents thought the course could be conducted in 2 weeks, some clearly stated that the 3-week format was too long to have employees away from responsibilities.

In 1990, the AASHTO Policy Committee approved a recommendation for AASHTO state-sponsored institutes by the Task Force on Management Institutes. This recommendation emerged from the expressed need for additional management training within DOTs. As a result, state DOTs are encouraged to sponsor management institutes conducted by Dr. De Coster. The course materials are recognized as very useful and oriented to meeting agency training objectives. Furthermore, in-state courses are not affected by the out-of-state travel limitations that many agencies are currently experiencing. Several states have initiated such individualized programs, one (Minnesota) is mentioned below in the DOT Courses and Programs section.

AASHTO/HUFSSAM National Highway and Transportation Management Conference

Since 1956, AASHTO and HUFSSAM have sponsored the National Highway and Transportation Management Conference. Courses are conducted by Dr. D. L. Howell, former director of National Highway and Transportation Management Institute, and Richard E. Luettich, Acting Commissioner of Transportation, Maine DOT. Seventy-five conferences have been held with more than 2,500 state and federal employees attending. Four offerings of the 1-week (4½ days total) conference were given in 1990; 150 transportation managers from 34 states participated. The 1991 conferences were held in Alabama, Washington state, Virginia, and Michigan. The varied locations lower travel time and costs for participants.

A maximum of 36 people attend each conference. In general, only two representatives from each member department are accepted for any one conference. Additional nominees from one agency are accepted only if space is available. In 1991, the registration fees were \$600 per person and covered only conference materials. Travel, meals, lodging, and other costs are the responsibility of the attendee or the sponsoring organization.

Conference Purpose: The purpose of the conferences is to assist state and federal highway and transportation departments in developing the managerial talent of key employees or those showing administrative potential.

1991 Conference Theme and Topics: The theme of the 1991 conferences was "Managing in the Changing Environment of the 1990s and into the 21st Century." The topics for the 1991 conferences are given in Table Seven.

The AASHTO *Survey* (23) also asked questions about the AASHTO/HUFSSAM Management Conferences. Thirty-eight member departments have sent personnel to the conferences. All responding agencies represented at the course believed it was use-

TABLE SIX
1990 NATIONAL HIGHWAY AND TRANSPORTATION MANAGEMENT INSTITUTE PROGRAM
TRACKS

Track Title	Topics
Track 1—Functional Management	Organizational Structure and Design Managerial Economics Managing with a Legal Department Creating Strategies for the Future Labor Relations in the Public Sector Emerging Physical Issues
Track 2—Communications	Executive Speaking Electronic Media Relations Print Media Relations Effective Listening for Managers Managing Relations with your Legislature
Track 3—Human Relations	Teambuilding Conflict Management Employee Motivation One-on-One Management Creativity & Managing Change Transformational Leadership
Track 4—Executive Self-Management	Significance of Management Styles Professional Ethics Time Management Individual Implementation Plan Stress Management Fitness Evaluation Executive Wellness Productive Meetings
Track 5—Management in Transportation Setting	Total Quality Management Customer Service Panel Discussions: (1) The Future of State & Federal Transportation Interface and (2) Leadership in a Dynamic Transportation Environment

ful, and more than 75 percent of this group thought the course met the agencies' training objectives. A few respondents' comments indicated that this course may be duplicating their agencies efforts or that it was not as well accepted as more in-depth courses. It is important to note that the conferences present basic management principles. Given the current awareness of the need for developing managers, a number of agencies have created in-house courses that cover many of the same basics.

AASHTO Proposed Programs for Future Development

Recently three programs have been proposed by AASHTO's Task Force on Management Institutes, which based its findings on a 1991 member department needs assessment survey. The

AASHTO Board of Directors must approve the programs before they are offered. The recommendations are as follows: (23)

- "Transportation Policy Forum—Designed to meet the needs of new and experienced state transportation executives, the Transportation Policy Forum will provide an opportunity for updates and discussion on the latest national transportation related issues. [These forums will be] one- or two-day meetings held in conjunction with national or regional AASHTO meetings.
- "Transportation Management Skills Seminars—Designed to refine specific managerial skills of middle- and senior-level transportation professionals. Participants will develop or sharpen management skills which are essential to functioning effectively as productive transportation managers in the public sector. [These seminars will be] one- or two-day meetings held in conjunction with national or regional AASHTO meetings.

TABLE SEVEN
 NATIONAL HIGHWAY AND TRANSPORTATION MANAGEMENT CONFERENCE NATURAL BRIDGE, VIRGINIA,
 SEPT. 8-13, 1991

Day	Activity/Session Title	Topics
Monday	Role of Transportation Managers—Present and Future	Role of Transportation Managers in the 21st Century The Changing Environment
	Case Preparation and Case Analysis	Process of Management Principles and Techniques Characteristics of Effective Management Problems of Transportation Managers Management in Turbulent Times Excellence in Transportation Agencies Megatrends in Year 2000
Tuesday	Motivation Theory	Emerging Concepts in Motivation Changing Value Systems
	Case Preparation and Case Analysis	Motivational Theories Creating a Motivating Environment Experimental Exercises
Wednesday	Communications	Communication Model Barriers to Communication Communication Styles Organizational Communications Negotiation/Conflict Resolution
Thursday	Effective Work Environment	Positive and Negative Factors Unions in Some Work Environments Time Management and Delegation Organizational Politics Orderly Work Environment Sexual Harassment
	Case Analysis by Teams	
	Nature of Leadership Experimental Exercises Case Analysis Team Reports	Leadership as an Influential Function Leadership Styles Effective Leadership Patterns Effective Relationships with the Boss
Friday	Managing Yourself	Stress and its Management Burnout
	AASHTO and FHWA Briefings	A Look to the Future

- "Transportation Management Development Directory—Published as an annual listing of internal and external management development programs conducted or sponsored by AASHTO member agencies."

FHWA/NHI Research Program Management for State Highway Officials

The FHWA/NHI sponsors or conducts many excellent highway related training and development courses. Originally, NHI included management training as well as technical training efforts. As the

overall program developed, technical training was very much in demand. In addition, there were many other fine management training organizations, including a number of state universities. As a result, NHI now tends to offer technical courses. The one management-oriented course currently offered is Research Program Management for State Highway Officials. This course is particularly directed to managers of state research programs. The course originated from discussions contained in an NCHRP study (24). The study recommended management development regarding research efforts and functions within transportation agencies.

Sessions are taught by Barbara T. Harder, former director of Research and Special Studies for PennDOT, and Howard Newlon,

former director of the Virginia Highway and Transportation Research Council. The 16-hour course may be conducted over 2 or 3 days, for which NHI assesses the state sponsoring agency a per-day rate. NHI recovers half of the cost of producing the course through registration fees. Depending on the number of attendees, the fee per individual is about \$50. The optimum number of attendees is between 20 and 40. The sponsoring agency is responsible for providing the facility in which the course is held. Attendees or their employers are responsible for the course fee and travel costs. The course was planned to be conducted in the four AASHTO regions and at the FHWA Turner-Fairbank Highway Research Center. However, because of out-of-state travel restrictions, a number of agencies are sponsoring the course at their facilities for their own employees.

Research Management Course Purpose and Goals: The purpose of the FHWA/NHI Research Management course is to provide a dedicated time for training and discussion regarding administrative and management techniques that have proven to be successful in the conduct of state transportation research programs. The primary goals of the course are for the participant to better understand the responsibilities and the role of transportation research management and to be better equipped and more motivated to manage self, staff, and resources more effectively. The seminar-style course provides an environment wherein participants evaluate where they are now and where they would like to be in the future regarding management of their respective research efforts. Because the course focuses specifically on the research manager as well as management concepts, it provides an opportunity for attendees to think strategically and to evaluate or reorder their management priorities.

Research Management Course Topics: The course is highly applications oriented. Management concepts and techniques are discussed using the specific situation in which the managers find themselves—i.e., management theory is applied directly to the day-to-day activities of the research manager. The short course format highlights topics of importance to the research manager, provides resources for further reading, and encourages attendees to seek in-depth training when appropriate. Topics included in the course are given in Table Eight.

Conclusions

These public sector, nationally available management programs are popular because they address critical needs in the transportation community. The exchange of ideas and the interaction among the participants is beneficial in and of itself. In every case, respondents comment that the time spent with others from different states or agencies is one of the most valuable experiences of the training.

SELECTED TRANSPORTATION AGENCY COURSES AND PROGRAMS

This section features a variety of programs, course offerings, and management development conceptual information from a representative sample of AASHTO's member departments. The agencies' materials included here are examples of some of the best programs and courses currently available. All survey respondents included comments and general information about their management training and development programs. More than 50 percent

of the respondents submitted very detailed course materials. A number of the respondent agencies use management courses sponsored by AASHTO and HUFSSAM and have not developed specialized management curricula for in-house use.

The courses and programs presented in this section were chosen to show the range of areas in which transportation agencies are actively pursuing management training and development. The areas of special interest to the agencies are concepts for management development, leadership development and succession planning, middle management development, supervisor training, and even specific courses dealing with topics such as sexual harassment. Each of these areas is described using the agency's materials as an example of successful implementation of the training or development activity.

Whenever possible, material was taken directly from the agency's course or program documentation. In general, descriptive information was excerpted from those sources.

Alberta All Levels of Management Training and Development

The Alberta Transportation and Utilities Department's management training and development program addresses three levels of management or supervisory personnel. The process of training personnel for management begins with an introductory course describing what it is to be a supervisor, progresses to beginning and middle managers, and then to senior and executive managers. The duration of courses is from 1 to 4 days. Instructors for management courses are primarily human resource and organizational consultants from outside the department. The organizational development section of the personnel branch of Alberta Transportation and Utilities Department develops an annual training calendar. They survey staff, evaluate the strategic directions of the department, and examine a number of performance appraisals to identify training needs. In addition to their in-house training, the organizational development section provides information on other courses, especially those of the Alberta Public Works Department and the Universities of Alberta and Calgary.

The department sponsors an In-house Management Certificate Program. It was developed to provide supervisors and managers with material that would enhance managerial competencies. Employees who are not yet supervisors but have been identified as having potential for future advancement may register for the program with appropriate managerial approvals. Employees who receive certificates are better prepared to accept greater managerial responsibilities.

The 1991-1992 courses offered for the various levels of management within the department follow. Each course is offered in response to the assessed needs of the management staff.

Pre-Supervisory Level: One main course is offered, "So You Want to Become a Supervisor." The course gives nonsupervisors the opportunity to learn the responsibilities of a supervisor and provides attendees with skills and knowledge that may assist in career advancement. If the appropriate approvals are given, qualified personnel who are not yet supervisors may enroll in the certificate program described next.

Supervisory and First-Line Managers: The primary training vehicle is the In-House Management Certificate Program. Requirements are (1) successful completion of six compulsory and three elective courses and (2) writing a 2,000-word essay on a manage-

TABLE EIGHT
RESEARCH PROGRAM MANAGEMENT FOR STATE HIGHWAY OFFICIALS

Session Title	Topics
Introduction	Philosophy of Training Seminar Evolution of Highway Research
Public Sector Environment	Maximizing Opportunities
Organizational Dynamics	Placement within the Agency Mission and R&D Policy
Organizational Resources	People and Facilities Internal and External to Organization
Program Profile	Profile of a Vital Program Relationships with Sponsors
Program Marketing	Internal & External to Organization Marketing Yourself & Your Program Credibility and Constituency Building
Program Finances	Sources of Funding Funding Levels
Program Evaluation	Programs with a Payoff
Project Management	Project Management Models Ingredients of Good Management, Effectiveness, Quality, & Accountability Project Selection
Project Administration	Administrative Responsibilities and Tools
Project Implementation	Effective Practice

rial topic selected by the manager of organizational development and the employee's immediate supervisor or branch head. Equivalencies are accepted when documentation is available showing that the employee has been trained in a specific area.

Six compulsory courses are to be chosen from the following:

- First-Line Supervisory Course or equivalent
- Management Preparation Program or Managing in the Public Service
- Understanding the Collective Agreement or Taking Disciplinary Action
- Performance Management
- Financial Management for Nonfinancial Managers
- Myers-Briggs Type Indicator and the Art of Managing or Strategic Leadership Skills.

Three elective courses are to be chosen from the following:

- Excellence in Customer Service
- Dealing with Difficult People
- Effective Writing
- Time Management
- Coping with Stress or Stress Management for Managers
- Interview Techniques

These courses and others are available to the employee not participating in the certificate program. Other courses include "Coach and Counsellor: A Key Role of Today's Managers," "Performance Management," "Team Building for Supervisors," and "Managing Conflict."

Senior and Executive Managers: Training courses for senior and executive managers are as follows:

- Corporate and Strategic Planning
- Orchestrating Team Performance
- Leadership for Change
- The Art of Negotiating
- Media Relations
- High-Performance Organizations and Visionary Leadership
- Monitoring Effectiveness in the Public Sector
- Seven Steps to Total Quality Management.

Course material excerpted from Organization Development Training Calendar, 1991-1992

British Columbia Excel, A Program to Develop Career Managers

The British Columbia Ministry of Transportation and Highways designed the Excel Program to fulfill future management staffing

requirements. The program's aim is to encourage employees to broaden their management skills and career options. The Excel Program consists of four phases: selection, development planning, education, and assignment. The employees participating in the Excel Program form a pool of eligible candidates for career advancement, thus providing management succession for the ministry. The 2-year program development began in 1990.

The Excel Program has a dual focus, the organization and the individual, aligning personal career goals with the ministry's human resource requirements. The objectives of the ministry and the individual reinforce one another to increase job enrichment and organizational efficiency.

Selection: The selection process consists of three parts: nomination to the program, awareness sessions, and assessment. Nominations to the Excel Program are made through a team consensus recommendation. The employee, supervisor, and second-level manager determine if nomination is appropriate. The number of nominees considered for the program is determined by critical management positions requiring potential internal replacements. Awareness sessions are designed to familiarize employees with the strategic direction of the ministry. The sessions are intended to expand the employee's appreciation of the challenges and rewards of all levels of management. At this time, employees are also encouraged to participate in opportunities to have an inside look at prospective positions. The assessment section of the selection process enables the ministry to recognize qualified personnel. A personal profile analysis and an assessment of potential for leadership and administrative qualities are done.

Planning: The second stage of the Excel Program is acceptance into the program. Acceptance is determined by comparing the assessment results with the position profiles of the employee's career choice(s). A development plan is then produced through a team approach—consultation among the individual, the supervisor, and the second-level manager. Each participant's plan involves successful completion of management courses and actual work experience. In-house training courses offered by the ministry's employee planning and development staff address a majority of the skills on the management development inventory. Excel participants are also encouraged to use educational institutes such as the British Columbia Ministry of Government Management Services Center for Executive Management and Development, universities, and other management schools to acquire the necessary competencies. The Center for Executive Management and Development has a very comprehensive management training program. It meets the training and development needs of four levels of management: entry level, middle, senior, and executive management. Its courses utilize internal staff instructors, training consultants, and British Columbia governmental deputy ministers, among others. The center also holds corporate memberships in management development associations and offers corporate member rates for seminars featuring nationally known speakers.

Education: The Excel Program uses a management skills inventory. Junior managers and middle managers are to develop specified management skills during the Excel Program. Technical expertise has reached a competency level at this stage of the employees' development.

The management skills junior managers are to develop are as follows:

- Leadership/team development
- Customer and client focus

- Problem solving/decision making
- Establish performance goals/standards
- Time and self-management
- Managing productivities
- Managing contracts and projects
- Financial management and control
- Employee recruitment and selection
- Managing human resources
- Managing innovation and change
- Conflict resolution
- Negotiation skills
- Business writing
- Oral presentation
- Coaching and developing people
- Program evaluation
- Managing information
- Political sensitivity.

The management skills middle managers are to develop are:

- Visioning and strategic planning
- Organizational performance evaluation
- Managing office technology
- Systems management.

A residential 5-day course is offered to all participants in the Excel Program. Furthermore, in conjunction with the formal training course work, Excel Program participants are provided with meaningful work experience, projects, and career assignments that transform the learned knowledge from management courses into demonstrated skills and abilities. Projects derived from the executive goals and divisions' operational objectives provide actual work experiences.

Assignment: On completion of each stage of the Excel Program, the participants become eligible candidates who, through competition with peers, will be considered to fill available management positions within the ministry.

Material excerpted from Excel Program brochure

California Supervisor's Workshop

Supervisor training courses are some of the most numerous development opportunities within the various agencies. Supervisor training extends from short-term workshops to week-long academies. One of the short-term workshops is the Caltrans Supervisor Workshop. The course content, presented in Table Nine, is a representative example of the many excellent supervisor training and development courses that agencies have created for this level of employee.

Course outline excerpted from Workshop descriptive materials

Colorado Transportation 2000

Along with other agencies, Colorado Department of Transportation (CDOT) recognizes that there will be significant employee turnover during the 1990s. Today's subordinate managers need to be prepared to assume positions of greater leadership and responsibility as the transition occurs at CDOT. In addition to executive-

TABLE NINE
THE CALTRANS SUPERVISOR WORKSHOP OUTLINE

1. The Supervisory Position	An introductory session defining the vital shift, what's different about supervisory positions, expectations of management, outline of course content.
2. The Supervisor's Role	Duties, responsibilities, and functions of first-line supervisors in state government.
3. Communications	Theories of styles of communication. The concepts of feedback, transmission, reception, barriers, filters, and other elements of the communications process are examined.
4. Listening	Practice in listening to help employees solve their own problems. Emphasis is placed on how to sharpen active listening skills.
5. Leadership & Direction	The supervisor as leader; methods and styles of influence with special emphasis on self-analysis and how different styles can be used.
6. Motivation	Concepts of behavior and motivation as applied to the role of a supervisor.
7. Personnel Management (Staffing)	Theory and practice of positions and classifications with emphasis on selection processes.
8. Personnel Management (Performance Standards)	Developing performance standards and objectives as a planning tool with emphasis on improving performance.
9. Personnel Management (Development)	Techniques of developing employees with emphasis on formal training and on-the-job training as a supervisory function.
10. Personnel Management (Appraisal)	Responsibilities of a supervisor in the appraisal process with emphasis on face-to-face discussion.
11. Discipline	Administering the state disciplinary process with emphasis on techniques and procedures. Responsibilities of a new supervisor as part of the management team are examined.
12. How to Make it All Work	Techniques of delegation and a re-examination of the supervisor's job; how to deal with problem areas.

level managers mentoring managers who report to them, CDOT has created a comprehensive training and development program for those in the pool from which the next generation of department executives will emerge. The program is called Transportation 2000: Developing Today's Managers for Tomorrow's Highways. The basis for this program is the planned development and retention of engineering and other transportation professionals with the technical and managerial acumen to ensure that CDOT will meet its goals in the year 2000.

Transportation 2000 was designed to train all of the approximately 175 CDOT managers who are below the executive management level. Participants are nominated by their managers and are strongly encouraged to attend. The course is conducted during a 2-week period and includes Sunday afternoon and Saturday morning sessions as well as evening sessions during the week. CDOT has proposed to conduct six courses from 1990 through 1993. The Department of Management at Colorado State University (CSU) has collaborated with CDOT to produce this course. A broad group of experts conducts the course, including CSU faculty; CDOT executives; and representatives from the governor's office, the legislature's joint budget committee, the highway commission, the FHWA, and others. The program includes a highly interactive format and incorporates team and group exercises. Some of the most important time in the course is spent in discussion with the department executives.

The course components are organized into three major areas: Colorado's Transportation Future and CDOT's Role; Human Resources Management; and CDOT Operations—Changing Priorities and Changing Practices. The topics presented in the course are as follows:

- Determining Expectations: Managing in CDOT—bureaucracies, organizations, constituencies; management definition
- Decision-making Insights—decision model, decision process
- Managing Time Effectively—prioritizing tasks, meeting management
- Operations in the Public Sector—external perspectives panel, internal perspectives panel
- Strategic Planning/Goal Setting
- Strategic Planning/Control Process
- Team Problem Solving
- CDOT Operations Panel
- Insights into Personal Styles
- Conflict Management
- Understanding/Managing Stress—stress/frustration/burnout
- Wellness
- Effective Relationships—leadership
- Understanding Labor Relations—labor relations/employment law
- Personnel Management Issues—appraisals and grievances
- Public Sector Quality Management
- Legal Issues
- Media Relations—dealing with the media; effective writing/effective presentations
- Effective Interpersonal Skills
- Participative Management
- Motivating via Coaching/Counseling
- Implementing Change

Material excerpted from Transportation 2000 proposed program description

Florida Certified Public Manager Program

Florida Department of Transportation uses the Florida Certified Public Manager (CPM) Program, which is conducted by Florida State University. The Florida CPM Program is part of a national effort to improve public management and to recognize achievement through professional certification. The program is a member of the National Certified Public Manager Program Consortium, which ensures content quality and serves as a national information clearinghouse. The Florida CPM Program is designed to help public organization middle- and top-level management teams enhance their ability to meet the challenges facing governments. Participants learn current management theory and job related techniques to improve public sector organizational performance. The program consists of a series of six courses titled Managing Government in Florida. The CPM Program is outlined in Table Ten.

Certification Requirements: CPM designation requires completion of four levels of coursework on managing government in Florida, required readings, exams, and job related projects that demonstrate the transfer of program concepts in the workplace. The CPM Program also awards a certificate in supervisory management, an interim designation that recognizes partial completion of the CPM Program. In addition, the Department of Public Administration at Florida State University awards graduate credit to eligible participants for work undertaken in the program.

Illinois Leadership Development Program

The Illinois Department of Transportation (IDOT) sponsors a leadership development program called GREAT (Growth, Recognition, and Employee Advancement Training). It is a program committed to employee excellence and the development of future leaders for the department. The GREAT Program provides a wide array of opportunities for various levels of IDOT employees.

GREAT consists of seven separate training programs, six of which apply directly to supervisory or management training. Most of the programs are designed for prescribed levels of employees and enrollment is restricted to those levels. Targeted employees attend all modules of the training program together. The courses directed to management training are briefly described below.

Senior Executive Development is designed for senior-level engineers and technical managers. This development opportunity consists of a 2-day in-service training seminar dealing with relevant administrative or transportation topics. Seminar presenters are nationally recognized in their areas of expertise. Fifty-five employees are eligible for participation.

The Executive Leadership Development Series is a middle-manager training module. It consists of seven seminar modules dealing with critical skills that are essential for this level of employee to function effectively. Seminars are conducted once every 3 months over approximately 2 years. Six hundred employees are eligible for this series.

The Accelerated Leadership Proficiency Series is designed for various technical, professional, and other employees at a comparable level with a minimum of 3 years of IDOT tenure. The series consists of 15 modules dealing with critical skills necessary to function effectively as a first-line manager. Seminars are held every other month over 2½ years. Nearly 2,000 employees are eligible for this series.

Growth and Training of Employees is an open enrollment pro-

TABLE TEN
 CERTIFIED PUBLIC MANAGER PROGRAM—MANAGING GOVERNMENT IN FLORIDA

Course Title and Description	Course Topics
Improving Managerial Effectiveness Introduces fundamental concepts and techniques of modern management applied to a government setting, focus on manager-employee relations.	Role of the Manager Leadership, Delegation, Motivation Goal Setting Performance Appraisal Interpersonal Communications Coaching and Counseling
Management of Group Performance Focuses on group dynamics and development of group-leadership techniques useful for developing and maintaining cohesive, productive work groups.	Personal Styles Problem Solving and Decision Making Management of Organizational Conflict Leading Meetings Group Dynamics Assessing Management Practices
Facing the Management Challenge Concentrates on the pressures and constraints placed on managers in public organizations and addresses techniques and strategies for functioning effectively within such constraints.	Organizational Climate Pressures in the Organization Constraints in the Organization Organizational Communications EEO and Affirmative Action Legal Liability and the Public Manager Management of Organizational Change
Managing Organizational Effectiveness Extends the manager's concern from the employee group to the overall organization, includes analysis of social change and its impact on the managerial environment. (Two part course)	Part A Power and Influence in Organizations Integrating Individual and Organization Productivity and Public Management Program Evaluation/Management Review Management Accounting and Control Part B Social Change/Public Management Impact Long Range Planning Planning & Budgeting Organizational Design Organizational Dynamics
Systems Focus Introduces the systems approach to management and examines specific systems applications.	Introduction to the Systems Approach Systems Analysis and Modeling Application I: Organizational Development Application II: Behavior Modification
Policy Perspectives Focuses exclusively on the managers's role in policy analysis and advocacy; examines social trends and implications for public management.	Policy Analysis: Overview Skills of Reasoned Argument Methodologies of Policy Analysis Negotiation Skills Policy Argument Simulations Management Round Table

gram available to most professional and technical employees. It is designed to develop a participant's communication, organization, and leadership skills and to improve employee productivity and morale. Seminars deal with topics such as personal growth (stress and wellness) and development of supervisory skills (performance management systems). Class size is based on the seminar topic

and usually ranges from 15 to 30 employees. The program is very popular and demand often determines enrollment.

The Maintenance Leadership Program is designed for lead workers, and other employees requiring supervisory skills development within the maintenance and traffic technical areas. The program improves leadership skills and employee productivity. Class size

is limited to 30 employees who complete the curriculum as a unit. Five hundred employees are eligible for participation in this program.

Special Training on Request permits an organizational unit to offer any GREAT seminar specifically for its employees. Copyrighted courses and other seminars tailored specifically to the unit are available.

All seminars are flexible to accommodate the particular needs or training objectives for any group of employees. Seminars include at least 2 days of intensive instruction and application. Consultants, IDOT training staff, or IDOT certified part-time instructors conduct or facilitate the seminars.

Course descriptions excerpted from GREAT program synopsis

Minnesota Management Academy

The Minnesota Department of Transportation (Mn/DOT) has taken the opportunity offered to AASHTO organizations to adapt National Highway and Transportation Management Institute for its own state training and development needs. The Mn/DOT Management Academy course material will be presented primarily by Dr. Thomas De Coster, Director of the national institute and will cover many of the same topics as the 3-week long institute, but will span 1 week, Sunday evening through Friday afternoon. The targeted audience for the Management Academy is all department management employees. As an initial offering, Mn/DOT expected to conduct two academies in fall 1991 and spring 1992. A maximum of 30 managers from various disciplines, experience levels, and department divisions attend each academy. The academies are held at off-site locations and feature lectures, small groups, and one-to-one activities. Attendees are expected to complete readings and assignments outside of the academy time frame.

Management Academy Purpose: The purpose of the Management Academy is to equip Mn/DOT managers with the knowledge, skills, and abilities to lead in a complex, changing work environment. The academy experience will give managers greater skills in planning and prioritizing; expanded ideas for handling conflicting customer needs and managing disagreements; assistance with changing workforces; creative problem-solving techniques; new ways to produce more and better services with limited resources; and opportunities to exchange ideas with peers.

Course Content: The course includes management assessment, case studies, conflict management, executive wellness, personal productivity, effective presentations, print and electronic media relations, creativity and managing change, effective meeting management, ethics of public employees, group leadership, managing with a legal department, stress management, implementation of concepts, and particularly Mn/DOT initiatives of quality improvement and strategic planning.

Course description excerpted from Mn/DOT course proposal material

New Mexico Sexual Harassment Course Outline

Recently sexual harassment has become a particularly important topic for training and development groups within transportation agencies. Many agencies are considering preparing or have recently prepared courses to better educate employees about the seriousness of the topic. The topic is relevant to all levels of

employees, including managers, and such courses are considered by many agencies as a valuable contribution to management training and development efforts. The New Mexico State Highway and Transportation Department course outline is shown in Table Eleven.

New York Management Development Concepts

The New York State Department of Transportation (NYSDOT) has spent a great deal of effort describing the reason for and the accomplishment of its management development program. The philosophies underlying the management development activities are notable.

Definition of Management Development: Management development is a collaborative process that integrates corporate goals and individual skills and interests. Participants in the process include top management, individual employees and their supervisors, and agency human resources staff. Management development begins with an understanding of current and emerging organizational needs, an analysis of the requirements and expectations of job holders, and the provision of organizational supports designed to prepare managers for their responsibilities.

The wide range of options for management development includes rotational assignments, special assignments within the current unit, short-term task force participation, training, self-study, advanced education, mentoring programs, targeted recruitment strategies, computer-assisted instruction, and changing systemic barriers (e.g., internal policies and civil service procedures). Management development is a continuous process that blends a changing organizational climate, special opportunities, and attention to daily operations in order to meet the needs of the organization and its members.

Highlights from NYSDOT Management Development Manual:

1. Management training is part of management development; agency support for a wide range of management experiences is essential.
2. Management development cannot be isolated or separated from routine assignments; it must be reinforced in daily exchanges and integrated into the performance management system.
3. Key positions with high payoff are the first priority for management development.
4. Quality training for the right employees at the right time is fundamental to changes in management practices.
5. The development plans of managers are to promote growth in less developed roles and reinforce achievement in the more dominant roles.
6. Many supports and resources are in place for management development—ranging from honest feedback to changes in testing methodology—each should be used to improve management.
7. Management development is a fundamental characteristic of the agency as specified in its mission and goals.
8. Opportunities and commitments identified through goal oriented management processes guide resource allocations.
9. An analysis of succession needs pinpoints the number and types of future managers required by the department.
10. Formal and informal needs assessments detail essential management competencies and their relationships to responsibilities.

TABLE ELEVEN
 NEW MEXICO STATE HIGHWAY AND TRANSPORTATION DEPARTMENT FEELING SAFE AT
 WORK—A SEMINAR ON SEXUAL HARASSMENT

Course Outline

Attitudes about Sexual Harassment—Self Survey
 Attitudes Survey Discussion
 What are the Facts about Sexual Harassment—Quiz
 Sexual Harassment Self-Test
 Definition and Examples of Sexual Harassment
 Sexual Harassment Behavior Patterns
 Levels of Sexual Harassment
 Attitudes of Men and Women
 Impressions from an Office/Stereotypes
 Who is Liable?
 Case Studies
 Why Some People Hesitate to Talk About Sexual Harassment
 How to Minimize Your Chances of Being Sexually Harassed
 How to Protect Yourself Against Charges
 Questions Frequently Asked
 Possible Situations
 Summary of Seriousness for Private and Public Sector Organizations

11. Individual development plans, based on organizational needs, are to be the building blocks for the management team.

12. Management development is one of the tools for implementing affirmative action commitments for the department.

13. Good managers must receive rewards that are meaningful.

14. A change in management culture is dependent on the performance of the department managers.

Material excerpted from Management Development Program, 1989 manual

Virginia Succession Planning

As has been discussed in this synthesis, succession planning is a concern for most transportation agencies. A number of agencies (Alberta's and New York's among others) have very good pro-

grams to provide management succession, but not a great deal of research has been done to understand the agency of the future and its requirements. Research conducted by the Virginia Highway and Transportation Research Council is documented in a 1992 report, *Development of a Program for Succession Planning in the Virginia Department of Transportation*. What is unique about this effort is its predictor model, which was developed through focus groups comprising the agency's top managers. The model answers questions such as what responsibilities the agency will have in the year 2000, and provides information on the composition of the future workforce of the department—the how and why employees leave or stay with the department. Recruitment and retention analysis predicts what employees will be needed, including women, minorities, and foreign nationals. The research presents a management assessment of what will be the needs and future direction of a state department of transportation. The results will be based on Virginia DOT data, but the methodologies are applicable to other transportation agencies.

REFERENCES

1. *Special Report 210: Transportation Education and Training: Meeting the Challenge*, Transportation Research Board, National Research Council, Washington, D.C., 1985.
2. *AASHTO 1914–1989, Moving America into the Future*, American Association of State Highway and Transportation Officials, Washington, D.C., 1990.
3. D. A. Aschauer, "Rx for Productivity: Build Infrastructure," *Proceedings*, 1988 AASHTO Annual Meeting, AASHTO, Washington, D.C., 1989, pp. 109–116.
4. *Special Report 207: Transportation Professionals: Future Needs and Opportunities*, Transportation Research Board, National Research Council, Washington, D.C., 1985.
5. W. B. Johnston and A. H. Packer, *Workforce 2000, Work and Workers for the 21st Century*, Hudson Institute, Indianapolis, Indiana, June 1987.
6. H. E. Davis, "State Highway Personnel Practices," *HRB Proceedings*, Vol. 30, 1950.
7. "Transportation Professionals: Recruitment and Retention, Results from a Survey of AASHTO Member Departments," American Association of State Highway and Transportation Officials, Washington, D.C., November 1988, pp. 40.
8. T. H. Poister, L. G. Nigro, and R. Bush, *NCHRP Synthesis of Highway Practice 163: Innovative Strategies for Upgrading Personnel in State Transportation Departments*, Transportation Research Board, National Research Council, Washington, D.C., August 1990.
9. J. M. Kouzes and B. Z. Posner, "The Credibility Factor: What Followers Expect From Their Leaders," *Management Review*, American Management Association, New York, January 1990, pp. 29–33.
10. T. H. Poister, "The Revitalization of PennDot, A Case Study in Effective Public Management," Pennsylvania Department of Transportation, Office of Research and Special Studies, Harrisburg, December 1986, 111 pp.
11. "Executive Book Summaries," in *Team Players and Teamwork*, G. M. Parker, Vol. 13., No. 4, Soundview, Inc., Bristol, Vermont, April 1991, p.8.
12. B. Felgner, "Rough Road Ahead for State DOTs," *American City and County*, August 1988, pp. 79–82.
13. J. Naisbitt and P. Aburdene, "The 1990s: Decade of Women in Leadership," in *Megatrends 2000*, William Morrow and Company, Inc., New York, 1990.
14. W. B. Johnston et al., "Civil Service 2000," prepared by the Hudson Institute for the U. S. Office of Personnel Management, June 1988.
15. D. Jamieson and J. O'Mara, *Managing Workforce 2000*, Jossey-Bass, Inc., San Francisco, California, 1991, 241 pp.
16. J. Sternbach, *NCHRP Synthesis of Highway Practice 137: Negotiating and Contracting for Professional Engineering Services*, Transportation Research Board, National Research Council, Washington, D.C., July 1988.
17. C. C. McMullen, *NCHRP Synthesis of Highway Practice 125: Maintenance Activities Accomplished by Contract*, Transportation Research Board, National Research Council, Washington, D.C., July 1986.
18. R. B. Newman, *NCHRP Synthesis of Highway Practice 145: Staffing Considerations in Construction Engineering Management*, Transportation Research Board, National Research Council, Washington, D.C., May 1989.
19. R. B. Newman, *NCHRP Synthesis of Highway Practice 146: Use of Consultants for Construction Engineering and Inspection*, Transportation Research Board, National Research Council, Washington, D.C., June 1989.
20. J. W. Poirot, "Current Trends in Engineering Training for Management in the United States," *Journal of Management in Engineering*, Vol. 3, No. 2, 1987, pp. 127–132.
21. L. A. Hoel and G. T. Johnson, Transportation Education and Training: An Institute for Chief Administrative Officers of State Departments of Transportation, in *Transportation Research Record 1101*, Transportation Research Board, National Research Council, Washington, D.C., August 1986, pp. 4–8.
22. L. A. Hoel and G. T. Johnson, "Policy Issues Focus of First Transportation Executive Institute," *AASHTO Quarterly*, Washington, D. C., January 1985, pp. 18–19.
23. Special Task Force on the AASHTO Task Force on Management Institutes, "Survey of Member Departments on AASHTO-Sponsored Management Development Programs," Washington, D.C., July 1991, 52 pp.
24. Transportation Research Board, *NCHRP Research Results Digest 170: Research Program Design, Administration of Highway and Transportation Agencies*, National Research Council, Washington, D.C., July 1989.

BIBLIOGRAPHY

- AASHTO and Highway Users Federation for Safety and Mobility, "Highway and Transportation Management Course 1991," Highway Users Federation, Washington, D.C., 1991.
- American Public Works Association Education Foundation, "Public Works Educational Programs 9/91-12/92," *APWA Reporter*, Vol. 58, No. 7, July 1991, pp. 18-29.
- American Society for Training and Development, "ASTD Books," ASTD, Alexandria, Va., 1991, 48 pp.
- F. L. Bennet and W. B. McMullen, "What are Engineering Employers Looking for in Engineering Management Graduates?," *Journal of Management in Engineering*, Vol. 3, No. 4, 1987, pp. 267-274.
- B. B. Collins, *NCHRP Synthesis of Highway Practice 120: Professional Resource Management and Forecasting*, Transportation Research Board, National Research Council, Washington, D.C., December 1985.
- P. F. Drucker, "Drucker on Management, Japan: New Strategies for a New Reality," *The Wall Street Journal*, October 2, 1991.
- Executive Book Summaries*, Soundview, Inc., Bristol, Vt., 1990-1991.
- G. M. Parker, "Team Players and Teamwork," in *Executive Book Summaries*, Vol. 13, No. 4, Soundview, Inc., Bristol, Vt., April 1991, pp. 8.
- Federal Highway Administration and American Public Works Administration, "State and Local Highway Training and Technology Resources," U.S. Department of Transportation, Washington, D.C., January 1989.
- P. A. Gallagan, "The Learning Organization Made Plain—Interview with Peter Senge," *Training & Development*, Vol. 45, No. 10, ASTD, Alexandria, Va., October 1991, pp. 37-44.
- B. T. Harder and H. Newlon, Jr., "Research Program Management for State Highway Officials Course No. 33043," Federal Highway Administration, National Highway Institute, McLean, Va., May 1991.
- L. A. Hoel and G. T. Johnson, "Policy Issues Focus of First Transportation Executive Institute," *AASHTO Quarterly*, January 1985, pp. 18-19.
- D. Landacre, "Transportation Education and Training; Training Needs Analysis for Senior Managers: The Assessment Center Method," in *Transportation Research Record 1101*, Transportation Research Board, National Research Council, Washington, D.C., August 1986.
- M. J. Lane, *Women and Minorities in Science and Engineering*, National Science Foundation, Washington, D.C., January 1990.
- S. H. Madsen, "How Do Engineers Learn to Manage?," *Civil Engineering*, ASCE, New York, February 1985, pp. 58-59.
- P. Morrison, "Making Managers of Engineers," *Journal of Management in Engineering*, Vol. 2, No. 4, 1986 pp. 259-264.
- G. W. Rimler and W. A. Pennington, "The Maintenance Foreman—Now a Manager," *AASHTO Quarterly*, April 1989, pp. 18-21.
- B. L. Rosenbaum, "Leading Today's Technical Professional," *Training & Development*, Vol. 45, No. 10, ASTD, Alexandria, Va., (October 1991) pp. 55-66.
- P. M. Senge, *The Fifth Discipline*, Doubleday, New York, 1990.
- J. W. Shay, "Recent Innovations in Contract Maintenance and Operations Privatization," *Proceedings, 1989 AASHTO Annual Meeting*, AASHTO, Washington, D.C., 1989.
- TRB Management and Productivity Committee A1A02, "Summary of Committee Questionnaires," Transportation Research Board, Washington, D.C., April 1991.

APPENDIX A SURVEY RESPONDENTS

STATES AND PROVINCES RESPONDING TO THE SURVEY

Alabama	Massachusetts	South Carolina
Alaska	Michigan	South Dakota
Arkansas	Minnesota	Tennessee
Arizona	Missouri	Texas
California	Montana	Utah
Colorado	Nebraska	Virginia
Connecticut	New Hampshire	Washington
Delaware	New Jersey	West Virginia
Florida	New Mexico	Wisconsin
Georgia	New York	Wyoming
Illinois	North Dakota	Alberta
Indiana	Oklahoma	British Columbia
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Kansas	Pennsylvania	Ontario
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APPENDIX B SURVEY SUMMARY

INTRODUCTION

This appendix contains a summary of responses to the Management Training and Development Survey which was sent to the 52 United States affiliated American Association of State Highway and Transportation Officials (AASHTO) member departments and the 12 Canadian member departments. The survey summary is reproduced below with questions and other material as originally contained in the survey. Responses herein are given directly following the question. Where comments and/or narrative responses were requested, a summary of the comments or the text of representative responses is included. When appropriate averages of the numerical responses are given. Summary responses to questions requiring a rating are weighted averages. Responses are written in italic to distinguish answers from the original survey text.

SURVEY QUESTIONS AND SUMMARY RESPONSES

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM "Management Training and Development Programs" Project Number 20-5/21-03

GENERAL INFORMATION

Your participation is very important to the success of the report which will be prepared documenting the training and development opportunities from AASHTO member departments and affiliate organizations. Thank you very much for your consideration and cooperation in this effort.

Approximate definitions for the three levels of management used in this survey.

- o First-line supervisors/managers--one to three years (1st level supervisory)
- o Middle managers--three years or more of management (one who supervises managers)
- o Senior managers--senior or executive level (one who manages a major function)

If the definitions used by your agency are significantly different, please describe:

Respondents confirmed that the definition of the above three categories of supervisory and management personnel was adequate. Several indicated that their agency does not link the number of years of service to a management position, but does use similar definitions to those in the parenthesis above. Several agencies incorporate more specific managerial categories, such as

AGENCY: 46 States and Provinces Responded

1. How many management employees are in your agency?

First-line supervisors/managers 71.4% of total supervisory and management personnel
 Middle managers 22.8% of total supervisory and management personnel
 Senior managers 6.1% of total supervisory and management personnel

2. Does your agency have a specific training curriculum or program for your management employees?

Required 17 Suggested 20 None specified 14

- *Four agencies indicated there is a required curriculum for First-line Supervisors and suggested curriculum for Managers; one agency has a required curriculum for Middle and Senior Managers; two agencies are in the process of developing curricula.*

3. Does your agency have a guideline or objective regarding the number of training dollars spent per individual (or per operating organization) per year? (e.g. 1% of salary, or .25% of operating budget...)

Yes 4 No 42

If yes, what is the guideline or objective?

- *Two agencies use a percentage of department operating budget as a guideline, Washington State uses an informal target of between 1 and 2 percent of annual work hours, or 20-40 hours of training annually. Five agencies commented that their guidelines were based on budgets and funding availability, annual training requirements, and annual business and corporate plans.*

4. If yes to the above question No. 3, are there different guidelines for the three groups of management level employees described in this survey?

Yes 1 No 1 If yes what are the guidelines?

- *Alaska has mandatory training for all supervisors; In Illinois and other agencies guidelines are set through the course curricula for each level of management employee.*

5. Although beyond the control of the human resources professionals, when agency budgets are tight, training may be deferred. In the past five years have management training or development opportunities been deferred in your agency for such or similar reasons?

Yes 23 No 22 No answer given 1

Question No. 5 Comments:

- *Of the agencies seeing deferred training and development, over 70 percent considered fiscal or budgetary constraints as a reason for decreased or deferrals; about one quarter of the agencies have either restrictions on travel or on consultant hiring (including training consultants) which reduces the access to training opportunities; with budget cuts there is less consultant training in New York state, but is reshaping training to rely on agency staff trainers; Florida is downsizing the workforce and concentrating on production demands rather than training; California scaled back management training in favor of required technical training.*

6. How much did your agency spend per management employee for training and employee development during the agency's past fiscal year? Please provide figures by type of manager if available:

- *From the answers received, it appears that statistics of this type are not universally tracked. Seven agencies provided a total expenditure by type of manager and about 1/2 of the agencies (22) included the total amount spent for management training. Costs reported ranged from \$15,000 for smaller agencies to over \$2 million for a large agency.*
- *Colorado averaged \$225 per employee for the 200 First-line Supervisors it trained, \$1,765 per employee for 75 Middle Managers; and \$5,000 for one Senior Manager.*
- *Wyoming estimates it spent \$1,000 per employee for its First-line Supervisors and Middle Managers and \$2,000 per employee for its Senior Managers.*
- *A number of agency responses seemed to indicate that costs for levels of employees were not specifically tracked; Ontario has a \$1,050,000 operating budget for training and development for its 8,400 staff members.*

7. Is the budget for training and development programs in your agency adequate to maximize the effectiveness of the management employees in your agency?

Yes 22 No 22 No answer given 2

- *Two agencies although answering yes, indicated that under normal operating conditions funds are adequate. However a high percent of management employees eligible for early retirement and other than normal fiscal conditions strained management and training budgets.*

If no, by what percentage should it be increased to maximize the effectiveness of the management team in your agency? Average of 58 percent increase to maximize effectiveness

- *Comments from agencies that would like to see more funds applied to management training and development, answers ranged from "How can anyone say their budget is adequate" or "an increase of 700-1000 percent" to a modest "increase (of) 5 percent." Excluding the 700-1000 percent which was more than 4 times higher than the next lowest estimate, the average increase for 14 respondents that gave numerical values was 58 percent.*

8. If you did not have budget constraints--an open-ended training budget for your agency. What kind of training and employee development topics would be added to your programs? (Use question No. 13 on page 4 for suggested topics if necessary.)

Below are listed the most often mentioned topics desired for additional training opportunities.

1. *Leadership*
2. *Strategic Management*
3. *Professional Technical Skills*
4. *Workforce Diversity, Team Building/Teamwork, and Communications (equal mentions)*
5. *Computer/Information Technology, Excellence/Quality (equal mentions)*

9. Time is always a concern. How do managers in your agency find appropriate time to avail themselves of the training and development programs offered to them?
Summaries of comments are as follows:

- *Managers establish their own priorities and schedule training as an integral part of their time; training is incorporated through good planning and prioritizing; time for training is budgeted because training is a high priority (fully self-initiated, positive attitudes)*
- *Careful scheduling of time and strong support from top management; managers are encouraged because of the priority given to training and development by top management--managers therefore, make time available; some managers are asked to attend by more senior managers; in other agencies top managers pre-register and prioritize the training and development opportunities for the management team (top management encouragement; personal attention by top managers)*
- *Several agencies see managers combining training and development programs with personal leave time--management retreats are becoming more popular and allowing this type of compromise, or by simply splitting the time "50/50" between department and individual time (some training and development on personal time)*
- *In order to take advantage of training five agencies stated that managers work more hours than a standard work week in order to keep up or that work awaits their return; three agencies mentioned that a manager's work is delegated or redistributed to provide for that manager's training program attendance (work more hours and delegate work while out of office)*
- *Seven agencies stated that much training at this level is required and managers must find the time to accommodate it; one agency stated that finding time is a major problem due to current staffing problems, however they have mandated certain segments of the management development program to ensure participation (required participation)*
- *Several agencies stated that quality of a training or development opportunity drives demand; managers take time if the course will be a benefit or is perceived as important; one agency saw that managers will only schedule training or development if it is a priority need (program quality)*

Question No. 9 Comments Continued:

- *A number of agencies schedule training courses during slack times for certain types of managers (winter months for construction managers, etc.); a number of agencies schedule 1/2, 1, or 2 day courses; one agency promotes conferences that allow several managers to "share" one training position so the managers are not committed to attending all-day sessions (time consciousness)*
- *Several agencies expressed that, "Even though training is a high priority, managers still have a difficult time getting away to attend." Workload and job pressures seem to win out. (time remains a problem)*
- *One agency has limited training available, so time for scheduling has not been a problem (downsized training budget)*

10. What priority do the following types of formalized courses have for management training and development programs within your agency? Please rate 3-high priority, 2 medium priority, 1-low priority, and 0-no priority. Please give priorities for each of the three types of managers; 1st=First-line supervisors/managers; Mid=Middle managers; Sr=Senior managers.

Management Level			Type of Training Course or Development Opportunity
1st	Mid	Sr	
<u>2.54</u>	<u>2.32</u>	<u>1.50</u>	Internally developed courses taught by agency or contractors
<u>1.65</u>	<u>2.09</u>	<u>1.84</u>	Externally developed courses taught by agency or contracted trainers (i.e. courses developed for your agency managers)
<u>1.95</u>	<u>1.84</u>	<u>1.41</u>	State courses taught by state or contracted trainers
<u>1.30</u>	<u>1.43</u>	<u>1.36</u>	Contracted courses (private sector offerings)
<u>1.09</u>	<u>0.95</u>	<u>0.77</u>	Video or audio cassette courses
<u>0.48</u>	<u>0.40</u>	<u>0.32</u>	Video--satellite training courses
<u>0.80</u>	<u>1.34</u>	<u>1.20</u>	University courses geared for agency management
<u>1.05</u>	<u>1.00</u>	<u>0.77</u>	Standard university curriculum courses
<u>0.95</u>	<u>1.00</u>	<u>0.66</u>	University undergraduate degree programs
<u>0.86</u>	<u>1.16</u>	<u>0.91</u>	University graduate degree programs
<u>0.55</u>	<u>1.48</u>	<u>2.05</u>	Transportation management/executive institutes
<u>0.48</u>	<u>1.23</u>	<u>1.75</u>	Management/executive institutes
<u>1.80</u>	<u>2.00</u>	<u>1.70</u>	Federal Highway Admin./National Highway Institute Courses
<u>0.82</u>	<u>1.00</u>	<u>0.70</u>	Management rotation opportunities

Other training and development opportunities listed:

- *Training that utilizes available staff experts (individual agency priority rating 1st-2, Mid-2, Sr-2)*
- *Task forces (1,2,2)*
- *Conferences, professional disciplines, strategic issues (3,3,3)*
- *Assignments to special projects (1,2,2)*
- *Public policy development/analysis/planning (2,3,3)*

Other Formalized Opportunities Continued:

- *Engineer training program (3,0,0)*
- *In-house management certificate program (3,2,1)*
- *Accelerated management program for women (1,0,0)*
- *Acting assignments (no priority rating given)*
- *State Highway and Transportation Management Institute, AASHTO (3,3,3)*
- *National Highway and Transportation Management Institute (2,3,3)*

11. Have you found that any one or another training or development type of presentation is more effective when training management employees? Using the list from question No. 10 above list the top three most effective types.

The top 6 listed types are as follows (other preferences were considered significantly less effective):

1. *Internally developed courses*
2. *Transportation management institutes; institute joint development with university*
3. *Federal Highway Administration National Highway Institute*
4. *Externally developed courses taught by others with agency input for course development*
5. *Externally developed courses*
6. *University courses geared for agency management*

12. Are there other opportunities, non-formalized (at the discretion of the employee), that are used to develop employee management skills?

Yes 31 No 10 No answer 4

Video courses 25 Audio cassettes 20

Twenty agencies offered both video courses and audio cassette courses, 5 offer video only

Other types of training and development opportunities at the discretion of the employee:

- *Friendships and informal networking are particularly powerful ways that women train and cross-train to improve their career options*
- *Discussion groups, readings*
- *Courses offered in the community, such as community college courses and other adult education programs*
- *Self-study manuals, workbooks, computer-based training; monthly "Self-development" Film Program*
- *Agency library resources*

Other Non-Formalized Opportunities Continued:

- *One-on-one consultations with trainers*
- *Professional association/society memberships*
- *On-the-job training; volunteering for "task force" assignment, job enrichment/enlargement, job reassignment, special projects, serving in an "acting" capacity in a higher level job*
- *Mentoring and coaching*
- *In-house presentations*

13. What priority do the following topics have in the training and development programs for the three levels of managers within your agency? Please rate 3-high priority, 2 medium priority, 1-low priority, and 0-no priority. Please give priorities for each of the three types of managers; 1st=First-line supervisors/managers; Mid=Middle managers; Sr=Senior managers.

Management Level			Topic of Training Course or Development Opportunity
1st	Mid	Sr	
<u>1.20</u>	<u>1.85</u>	<u>1.91</u>	Fiscal/financial
<u>2.11</u>	<u>2.07</u>	<u>1.45</u>	Computer usage
<u>1.80</u>	<u>1.82</u>	<u>1.59</u>	Workforce diversity
<u>2.25</u>	<u>2.39</u>	<u>2.16</u>	Leadership
<u>1.27</u>	<u>1.34</u>	<u>1.32</u>	Employee retention
<u>0.57</u>	<u>0.82</u>	<u>1.00</u>	Marketing
<u>1.36</u>	<u>1.66</u>	<u>1.66</u>	Negotiating skills
<u>1.86</u>	<u>2.00</u>	<u>1.66</u>	Writing
<u>1.52</u>	<u>2.00</u>	<u>1.66</u>	Public Speaking
<u>1.23</u>	<u>1.86</u>	<u>2.02</u>	Media/press contact
<u>2.05</u>	<u>2.27</u>	<u>2.07</u>	Decision-making/problem solving
<u>2.20</u>	<u>2.25</u>	<u>1.82</u>	Personnel management
<u>2.41</u>	<u>2.50</u>	<u>2.16</u>	Communications
<u>1.53</u>	<u>1.64</u>	<u>1.61</u>	Ethics
<u>1.82</u>	<u>1.82</u>	<u>1.55</u>	Time management
<u>1.59</u>	<u>1.68</u>	<u>1.45</u>	Stress management
<u>2.39</u>	<u>2.39</u>	<u>2.05</u>	Teamwork
<u>2.00</u>	<u>2.16</u>	<u>1.86</u>	Delegation
<u>1.30</u>	<u>1.55</u>	<u>1.50</u>	Innovation and entrepreneurship
<u>1.86</u>	<u>1.98</u>	<u>1.98</u>	Excellence/quality
<u>1.23</u>	<u>1.61</u>	<u>1.59</u>	Liability/risk management
<u>1.02</u>	<u>1.70</u>	<u>2.11</u>	Strategic management
<u>2.25</u>	<u>2.02</u>	<u>1.89</u>	Professional technical skills

Other topics listed:

- *Workforce Literacy (individual agency priority rating 1st-3, Mid-1, Sr-1)*
- *Project Management (2,3,1, could be included as a technical related skills)*
- *Conflict Resolution/Management (listed twice 3,3,3; 2,1,1)*
- *Managing Change (21st Century Management) (3,3,3)*
- *Productivity and Motivation (3,3,3)*
- *Performance Appraisals (no priority given, but could be considered personnel management)*
- *Strategic Planning (3,3,3, this could be included in strategic management)*
- *Customer Satisfaction (3,3,3, considered a quality issue)*
- *Equal Employment Opportunity issues to comply with current laws and avoid current explosion of lawsuits, particularly sexual harassment (0,1,0, could be included as a broader issue within the general workforce diversity topic)*

14. What were the three topics of greatest concern 5 years ago, the three of most concern today, and what do you think will be the three topics of greatest concern 3 years from now, in say 1994?

5 Years Ago (1986)

1. *Leadership*
2. *Professional Technical Skills*
3. *Communications*
4. *Personnel Management and Computer Usage (both concerns with same rating)*
5. *Time Management*

Today

1. *Leadership and Workforce Diversity and similar workforce issues including sexual harassment (both concerns with same rating)*
2. *Computer Usage*
3. *Fiscal/Financial Issues*
4. *Communications and Professional Technical Skills (both concerns with same rating)*
5. *Strategic Management/Planning*

3 Years in Future (1994)

1. *Workforce Diversity and related Human Resource Issues*
 2. *Strategic Management/Planning*
 3. *Excellence/Quality*
 4. *Leadership*
 5. *Fiscal/Financial Issues*
 6. *Computer Usage and Information Technology; Ethics; and Innovation/Entrepreneurship (all three concerns with same rating)*
 7. *Teamwork/Teambuilding*
- No. 1 was clearly rated the highest concern; Nos. 2-4 ratings were closely grouped indicating a second tier of concerns; Nos. 5-7 ratings were closely rated indicating a third tier of concern*

15. Has your agency used any new or innovative methods to assist managers in getting the training or personal tools needed to perform their management duties? If yes, please describe them below and/or include descriptive information with your return of the completed survey.

Innovative methods listed:

- *Comprehensive training database*
- *Assessment Center to measure training effectiveness*
- *Leadership Assessment Survey which captures the perceptions of staff, peers and supervisor*
- *In-house Mid-level and Executive Level workshops with hands-on activities and simulations*
- *Two-week AASHTO Management Institute pilot*
- *Use of certified full-time employees as part-time trainers in specific subject areas*
- *Mobility assignments; special development job assignments*
- *Graduate school as a work assignment*
- *Informal discussion groups*
- *"Adopting" trouble/transitional units*
- *Use of a Department Training Advisory Committee*
- *In-field coaching*
- *Learning Resource Catalogue*

16. Does your agency provide for the technical training of managers to enable them to incorporate new technical expertise required due to a promotion or to maintain any necessary technical expertise in their current position?

Yes 42 No 1 Some 1 No answer given 1

If yes, what kind of opportunities are provided?

- 30 Professional association courses
- 27 Technical refresher courses
- 32 University coursework (*via tuition refund programs*)
- 33 Agency sponsored courses
- 24 State sponsored courses
- 40 Federal Highway Administration/National Highway Institute courses (*for technical refreshers*)
- 34 On the job training

Other:

- *Contracted consultant training*
- *Purchased training videos, a/v, and correspondence courses*
- *Job rotation*

17. Does your agency provide opportunities for consultants and contractors that perform work for the agency to participate in any agency sponsored training and development programs?

26 Agency sponsored management or technical training courses

26 Federal Highway Administration/National Highway Institute courses

(17 agencies do both, 18 agencies do one or the other, one is just starting this type of effort)

Other:

- *Workshops, seminars, and conferences*
- *Specially developed seminar and teambuilding activity for construction project contractors*
- *Joint training with the Associated General Contractors*

How are the consultants and contractors chosen?

- *Announcements of training and development opportunities are sent either to all agency consultants and contractors or a specific list of consultants and contractors is prepared based on the type of project or the amount of work the outside organization is performing for the agency*
- *No specific criteria, but on a first come, first served basis; 1/4 of respondents to this question allow this; several stress that the outside organization must pay its own fees and that acceptance to courses or seminars is based on space availability and on technical need*
- *Several agencies rely on the outside organization's request to participate, and one agency accepts nominations from consultant/contractor groups and associations who are representative industry stakeholders in the state transportation system*

18. When agency services are contracted to an outside organization, does your agency have a means to determine if the contractor has adequately trained employees?

Yes 31 No 3 Not of Concern 11 No answer given 1

If yes, what is done at your agency?

- *Certain highway construction projects have training goals, and Title 6 assurances are incorporated in contracts awarded during project development process; adequate training of contractors is a contract condition; through request-for-proposal evaluation process to measure contractor qualifications*
- *At the time of contract negotiations, the contractor/consultants must present job descriptions for their employees. These job descriptions must document qualifications of employees to successfully perform the job. Alternatively, statement of qualifications for staff for service contracts. Contractor compliance inspections and internal review and audit efforts include training records inspections.*
- *Through certification and qualification process; particularly in technical areas by meeting technical certification requirements*

19. Does your agency make strategic decisions about who gets training and in what area?

Yes 31 No 12 No answer given 1

If yes, what are the origins of these strategic decisions?

- *Top management, governing boards, key department staff, assistant commissioners and other executives in the agency*
- *A variety of high level committees that make strategic decisions; e.g. Technology Transfer & Training Advisory Committee; Management Development and Training Committee; Engineer Training Committee, and others*
- *Training needs assessments: some agencies perform these assessments department-wide and input needs into the overall agency's strategic management decision-making; a number of agencies base training on the individual's needs using information from the employee's performance appraisal*
- *A number of agencies used a combination of strategic and tactical approaches to training. One agency's response included strategic plans, operational objectives, and performance goals for employees*

20. Are there differences in the training plans/opportunities between unionized and non-unionized employees in your agency?

Yes 8 No 30 No answer given 1 Not applicable 5

If yes, what are the differences?

- *Non-union workers often generate their own requests to meet their individual needs. Union workers respond to "offerings" or are directed to participate.*
- *Union personnel are primarily restricted to technical training programs. Non-union employees are encouraged to participate in both technical and leadership development training.*
- *Different unions specify the amount of funds that can be spent for University courses; in-house training has to be taught within the employee's exact working hours; there are professional development funds that vary with union contracts.*
- *State sponsored courses are designed for different bargaining units/unrepresented employees; some cross-registration is available*
- *More developments/opportunities at higher levels in the organization (usually management), otherwise relatively equal; training for success in current job, whether that be professional, managerial, or technical*

21. Who refers or sends people to training?

- 32 self referral
- 23 directed by performance appraisal
- 21 agency development plan
(10 all three above)
- 25 directed by management or supervisor

Comments:

- *Supervisor recommendation, referral, or request*
- *Senior management refers employees for training other than required supervisor classes*
- *Some central selection*
- *Section head or supervisor directed/encouraged*
- *Some employees are fast-tracked by participation in targeted program*
- *Mandatory/required courses ensure attendance, some positions require training for promotion*

22. Do you see trends emerging among the first-line (entry-level) or newly hired management employees within your organization such as: (Check appropriate issues)

- 32 Increased diversity of management employees (includes women and minorities)
- 27 Loyalty to organization being replaced by concern for personal growth in career
- 23 More reluctance to relocate due to a promotion
- 20 Increased emphasis given to leisure time
- 17 Increase in non-engineering trained candidates applying for management positions
- 13 More educated management employees having more options open to them for career moves
- 5 Increased requests for leave of absences for elder care or other similar family reasons

Other:

- *Increased need for training in computer and financial skills*
- *Increased awareness by engineers of their need for management skill training*
- *Many of our supervisory/management positions in the engineering area still require an engineering degree as a minimum qualification. If that were not so I imagine more people would apply for these positions*
- *Increased requests for specialized technical training*
- *More emphasis on professional development opportunities*
- *Growing concern over impact of equal employment goals on career opportunities*

23. If you have additional comments regarding management training and development within your agency, please use the space provided below.

Responses to this question were so diversified that it would be counterproductive to summarize or consolidate comments. Full text responses are included below:

Full Text Responses to Question No. 23:

- *FY90 57% of professionals received training, FY 91 - to date, 38% of professional workforce have received training (Alaska)*
- *We need to complete the development of a core of required courses for newly promoted and existing managers and supervisors. We need to maximize the use of our in-house info system to maintain and analyze training statistics/data. (Delaware)*
- *The department has a very strong training and development program focusing on technical skills in computer usage, professional engineer training, right-of-way and surveying, financial management, personnel management, and specialized job skills training in all DOT functional areas. Supervisory/management courses are designed and instructed in-house and through outside resources to meet the needs of the department. (Florida)*
- *I have included a narrative of the various training programs offered by the department and other relevant information. The secret to our success is the methodology we use to train employees. All seminars use department related materials in teaching objectives of the course, e.g. ethics, productivity, conflict resolution. Participants work in small groups and self discover the value of skills and concepts taught. Participants learn as much from one another as they do the facilitator. High standards for all presenters ensures that quality learning is the prime objective. (Illinois)*
- *We preformed a training needs assessment and developed strategies to fulfill those needs on a long-term basis. In the past year budget restraints severely restricted our ability to maintain momentum on ongoing programs. (Indiana)*
- *Managers, supervisors, administrative and clerical support staff are offered a voluntary opportunity to take advantage of securing a training certificate. After they take a required number of courses and an option of five more courses, they are awarded a certificate by the Governor. 79 employees have completed their 15-18 required courses and received certificates from the Governor. We have 182 employees in the process of completing their certificates. (Iowa)*
- *Heavy emphasis was placed on management training throughout the 1980's. We are just now at the point where turnover and times has necessitated a "new round" of management courses. We expect to increase management training in the next year. (Kentucky)*
- *Our agency has only recently engaged in the systematic provision of management training to all engineers and personnel at the level of section head and above. This program has been in effect for 3 years with training available through a state government sponsored program. We have also provided training in effective supervisory techniques to first-line supervisors (generally technicians in supervisory capacity). We would like to see AASHTO sponsored management training which is specifically geared to transportation professionals at the senior/executive level made more available by geographic region - i.e., we cannot avail ourselves of the current opportunities in AASHTO program due to lack of class space as well as travel costs/restrictions. (Louisiana)*

Full Text Responses to Question No. 23 Continued:

- *We are currently developing the following courses: 1) One week management institute using Dr. Thomas DeCoster for 130 managers; 2) Performance Communications System; 3) supervisory training based on needs assessment; and 4) in-house Leadership Academy. (Minnesota)*
- *Management training and human resource development in general has been extremely limited within our agency. We need to give attention to all aspects which have been addressed in this survey. We will appreciate your completed analysis of this survey. (New Hampshire)*
- *I confess to a fierce hope that your final report and recommendations for AASHTO training emphasis will focus on the urgent issues of ethics, diversity and partnership leadership training. Tom DeCoster is coming on 7/31 to assist us in establishing a state institute that will emphasize these issues. (New Mexico)*
- *Many of our options are provided centrally to state employees. This fosters interagency networks and problem-solving. Personal ownership and commitment are pivotal. Involuntary and prescribed training are hard to sell and lead to little behavior change. (New York)*
- *The state is currently revisiting our management and supervisory curriculum. Emphasis in our agency has been on technical training in past rather than on management/supervisory courses. As Human Resource professional, I would like to see more emphasis and credibility placed on management/supervisory training. Effective managers are vital to future of every agency. (Tennessee)*
- *We are emphatic about conducting management training off-site. Short workshops (one day) are being taken out to districts to reduce travel expenses. Exploring computer-based training and satellite video training for purely factual types of management information. (Texas)*
- *Response to this questionnaire has been difficult because the agency is just now embarking on a concentrated management training effort. Our responses are very subjective and should be considered in that context. (West Virginia)*
- *Departmental programs tend to be currently focused on the development of the first-line supervisor and to some lesser extent, the senior management ground. Middle management receives little direction in terms of their development. (New Brunswick)*
- *As noted in our response to AASHTO Management Development Programs survey, we have a two-three year "Engineering Development Program." New engineering graduates develop skills/knowledge through 6-9 month assignments in a variety of engineering functions and geographic locations. supplemented with two 1-week management seminars, and participation in applicable training programs. (Ontario)*

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