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Final Report

INDOT Training Needs Study

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April 28, 2000

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INDOT TRAINING NEEDS STUDY

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

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16. Abstract

During the strategic plan development process, the INDOT staff identified a list of possible training needs, which included suggestions for workshops, certification procedures, training sessions for interpersonal communication, computer skills, and video conferencing, as well as more specific topics such as hazardous areas and clean up of contaminated soil. This study's objective is to assess current and future training needs at INDOT on a comprehensive basis, as well as analyze current and future trends in order to fulfill the INDOT strategic goals and objectives.

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INDOT Training Needs Study

Introduction

As technology advances, the need for employee training increases so workers are not left behind with skills that are no longer applicable in the workplace. Companies and organizations worldwide are focused on meeting the training needs of their employees, and the Indiana Department of Transportation (INDOT) is no exception. For instance, the preliminary interviews of this research revealed that many INDOT managers and supervisors do not feel that their employees' level of competency with computers is adequate to meet changing computer application needs, including how to utilize the Internet for research and reference. INDOT employees indicated that they also realize that new kinds of skills are essential to their current and future jobs. This need was given high priority during the INDOT strategic plan development process in 1998. At that time INDOT staff identified a list of possible training needs, which included suggestions for workshops, certification procedures, training sessions for interpersonal communication, computer skills, and video conferencing, as well as more specific topics such as hazardous areas and clean up of contaminated soil.

This research study was conducted to evaluate INDOT's present training program and consider possible new directions to utilize new technologies to increase the quality of its training, make training programs conveniently available to more employees, and reduce overall training costs.

Findings

Telephone and face-to-face surveys and written questionnaires were the major tools of this research, which included the following:

- a baseline survey of other DOTs to assess their training efforts and how INDOT's effort compares;
- a comprehensive INDOT job inventory survey based on current job classifications; and
- questionnaires completed by INDOT managers and staff regarding future training needs, division and district training programs, job duties definitions, and supervisor's perspective on job performance.

The following facts were obtained from the surveys and questionnaires.

- INDOT's Training Section is more than 2.5 times smaller than the average DOT training section, and its staff has less than 50% of the years of training experience of other states.
- The budget of INDOT's Training Section is much lower than average, but INDOT provides more than 2.5 times the average hours of formal training of the other states (24) responding in the survey, at about half the average cost per employee. The number of new training programs initiated by the Training Section, however, is far lower than the average of the other states.
- INDOT's training function is more centralized than that of the other states. More than double the training is taught, financed, and approved by the Training Section than the average of the other states. The Training Section, as opposed to the districts and divisions, is responsible for more training-related activities (i.e., administration, instructional design, needs analysis) than the other states. This is particularly interesting in light of INDOT's smaller training section size and budget.

Implementation

Following are the main recommendations of the research, which will be studied further for implementation.

- Develop a policy for Computer-Based Instruction (CBI) and Web-Based Training (WBT) on the job and increase the number of offerings through these delivery methods. Internet accessibility for INDOT employees should also be increased.

- Offer more computer skill training through multimedia training tools, which is a very cost-effective approach.

- Identify technical training needs that cannot be met through existing course offerings such as NHI. The Training Section should coordinate this effort with Design and Construction and Contract Divisions.

- Obtain videoconferencing capabilities at the district offices that will enable training and accommodate meetings as well. This will save time and money for the Department.

- Review content of existing courses that are offered statewide, as well as by individual districts and divisions, in order to minimize duplication and to provide consistent, uniform, and standardized training.

- Invest more resources into training, including more personnel, training for the trainers, and hardware and software tools to support the efforts.

- Develop more effective training evaluation programs and use the feedback to improve the training deliverables. Further, develop and put in place an on-going training needs assessment program, as well as a method to submit, collect, and review "best practices" from the districts.

- Create an incentive program for employees to do training.

- Create an emphasis and priority for training throughout INDOT. This message has to be embraced at the executive level and become a part of the Department's philosophy in its mission statement or quality assurance program.

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Executive Summary

This information is based on survey and questionnaire information performed on the project. One survey was a baseline survey of other DOTs to assess their training efforts and how INDOT's compares. Another survey developed an INDOT job inventory. Questionnaires were performed for future training needs, division and district training programs, job duties definition, and supervisor's perspective on job performance.

The following items are the main recommendations.

- Develop a policy for Computer Based Instruction (CBI) and Web Based Training (WBT) on the job. Increase the number of offerings through these delivery methods. Increase Internet accessibility for INDOT employees.

- Offer more computer skill training through multimedia training tools, which is a very cost effective approach. This will require an additional staff person in the training section. Multimedia training tools require computers equipped with a sound card.

- Technical work within INDOT is suffering from lack of training. For example, Highway Engineers 4 in the Design Division reported no training (see Table 47). Also, Highway Engineers 4& 5 only had a job approval rating of 39% by their supervisors and Engineering Assistants rating was 40%. The training section should work with Design and Construction and Contract Divisions to identify technical training needs that cannot be met through existing course offerings such as NHI. One specific area identified is in bridge design. Additional training needs are described in Table 14.

- Obtain videoconferencing capability at the district offices that will provide training capabilities and accommodate meetings. This will save time and money for the Department.

- The Training Section should review content and develop courses that are offered statewide as well as by districts and divisions in order to minimize duplication and to provide consistent, uniform and standardized training. For example, notice the disparities in spending. The Human Resources Division spent $80,000 in 1998 while Technical Services spent $700. LaPorte spent 8 times what Seymour did on safety and Vincennes spent 9 times what Greenfield spent on construction training. Also, Laporte spent a total of $358,550 while Seymour spent $103,925 in training. Determine which topics can effectively be delivered through CBI or WBT. Work with Information Services to determine the network demands and support requirements for delivering training through the LAN and WAN. For example, there are several areas in maintenance training that are common to all districts.

- The following facts were obtained from the surveys and questionnaires. INDOT's Training Section is more than 2.5 times smaller than the average DOT training section, and its staff has less than 50% of the years of training experience of other states. The budget of INDOT's Training Section is much lower than average. However, INDOT provides more than 2.5 times the average hours of formal training of the other states (24) responding in the survey, at approximately half the average cost per employee. The number of new training programs initiated by the Training Section is far lower than the average of the other states. INDOT's training function is more centralized than that of the other states. More than double the training is taught, financed, and approved by the Training Section than the average of the other states. The Training Section, as opposed to the districts and divisions, is responsible for more training-related activities (i.e., administration, instructional design, needs analysis) than the other states. This is particularly interesting in light of INDOT's smaller training section size and budget.

- Using the above facts, INDOT needs to invest more resources into training, including more personnel, training for the trainers, and hardware and software tools to support the efforts. The Training Section needs to develop more effective training evaluation programs and use the feedback to improve the training deliverables. Develop a method to submit, collect, and review "best practices" from the districts. Develop and put in place an on-going training needs assessment program.

- Create an incentive program for employees to do training.

- Table 16 summarizes how jobs are changing within the Department. These responses help to predict the type training that will be needed. Influencing factors will be more demand on employees, more technical products and materials to work with, downsizing will continue, more reliance on information technologies, and the necessity for employee diversification. Table 18 describes how this evolution in the Department will impact training. The needs will be more cross-training for employees, increased need for computer skills, increased need for time, project and people management skills, more efficient training delivery, customizable and timely CBI and WBT topics, and increased need for continuing education.

- INDOT spends $168/employee/year on training. This compares to $923 spent by other DOTs and $1526 in the private sector. Management support for training is viewed as lukewarm (2.7 out of 5). Create an emphasis and priority for training throughout INDOT. This message has to be embraced at the executive level and become a part of the Department's philosophy like a mission statement or quality program.

Introduction

As technology advances, the need for training increases. Companies and organizations are focused on meeting the training needs of their employees. In this section, characteristics of the training programs at INDOT are compared to national training trends. Some of the results from the training needs assessment research performed by Purdue for INDOT is placed in context to fully understand how INDOT compares to other organizations.

The Need for Training and Education

Americans have a passion for learning and self-improvement. The American population is aging, and this is reflected in the age of the students now participating in educational programs.

Fact	Nearly half of all Americans aged 35 to 54 are taking adult-education classes, up from just 17% in 1984. Of the 15.2 million people enrolled in U.S. colleges and universities, 6.2 million, or 41%, are 25 or older. In fact, 1.6 million of these students are over 40. More than half of all graduate students are over age 30, and nearly a quarter are over 40.
Comparison	75% of INDOT employees are participating in some kind of training sponsored by INDOT.

The American Society for Training and Development estimates 75% of the U.S. work force will need retraining in the next few years to keep pace with market demands and increasingly global competition. Technological changes are also driving this. In particular, advances in computers, communications, and the Internet require different kinds of skills than what may have been available or taught when the current employees went through school. Additional training is needed.

INDOT employees realize that new kinds of skills are essential to their current and future jobs. Many of INDOT's managers and supervisors do not feel that their employees' level of competency with computers is adequate to meet changing computer application needs. Major complaints from INDOT managers are that the computer classes offered are full (individuals have to wait several months for the desired module to become available in the DOA's cycle of classes), they train only low-level computer skills (current lessons not structured well for individuals who currently have adequate computer skills, but wish to learn more complicated, higher level computer skills), they are specific to Microsoft products (managers feel that learning only the basic Microsoft Office applications addresses only a portion of INDOT's computer applications needs), and courses on how to utilize the Internet are not available. Many managers felt that their employees lacked the ability to conduct a basic Internet search to find research or reference information. They felt the Internet could be a powerful tool to benchmark other DOTs, find articles (both from newspapers and research journals), and share information within INDOT.

Fact	Employees need to be trained in computers, communications, and the Internet.
Comparison	INDOT managers recognize the need for training in these areas.

Training is essential so that workers are not left behind with skills that are no longer applicable in the workplace. The National Workforce Assistance Collaborative, an agency of the Labor Department, reports, "Workers who do not keep upgrading their skills will be left behind by workplace change—either in low pay, dead end jobs, or unemployed." Unfortunately, many INDOT managers have the attitude that trained workers will leave INDOT for the private sector. They believe that spending money on training will be a waste of time. The alternative is just as bad: poorly trained workers in low pay, dead end jobs will staff INDOT.

Fact	Workers need to upgrade skills to remain competent and competitive.
Comparison	Some INDOT managers think that trained workers will leave INDOT for the private sector, and, therefore, believe that training can hurt the overall enterprise.

The training received in school prior to working in INDOT by employees in technical jobs or clerical workers dependent on hardware and software, may no longer be applicable to function properly in the current workplace. In fact, the training received three to five years ago may have become obsolete in many areas. Carol A. Twigg and Diana G. Oblinger, authors of *The Virtual University*, a report on workplace trends and technology-assisted education, said the "shelf life" of a technical degree is now less than five years. Hewlett-Packard Co. estimates the "half life" of an engineering degree at 18 months.

Managers at INDOT must be cognizant of these changes, and institute training programs to keep skills current. This is not always done currently. For some highly technical jobs, such as Highway Engineer 2, the people in these jobs reported that they had not received any formal training recently at INDOT. Some of the training received in short-course education programs will not have a long shelf life. Courses that teach problem-solving skills will be applicable to many different situations across a longer time period.

Fact	Shelf-life and half life of some kinds of training is very short.
Comparison	Some training, especially in technical areas or those dependent on using computers and software, has exceeded its shelf life at INDOT.

Perceptions of the Need for Training

The purpose of training is to improve the quality and efficiency of work. Quality changes occur because workers can apply their expertise, after receiving the proper kind of training, to improve their work. Efficiency improves when workers are trained to apply the correct tool to the problem. From the survey information we received, INDOT managers felt that the quality of work at INDOT is low. They also indicated that as downsizing continues, current workers would have to handle their jobs more efficiently.

Fact	Training should improve the quality of work.
Comparison	INDOT managers felt that only 60% of the job tasks performed by INDOT employees were performed well.

Training is essential for technical jobs, yet little is provided and job quality by INDOT managers is perceived to be low.

Fact	Training should improve the quality of technical work.
Comparison	For those employees in technical jobs (highway engineers 4 and 5, job code 6), supervisors felt that only 39% of the tasks were performed well. For technical workers (engineering assistants at job code 3), supervisors felt that only 40% of the tasks were performed well.

Fact	Training should result in productivity improvements.
Comparison	In assessing future training needs, INDOT managers felt that downsizing and attrition will continue. Therefore, improving the productivity of a smaller workforce is the only way to maintain current levels of overall productivity.

Fact	Training could help in the retention of workers.
Comparison	If workers see self-improvement and perceive a commitment from INDOT for overall quality improvements, then they will be more likely to continue working for INDOT.

The nature of work is changing. As organizations enter the knowledge age, employees must become "knowledge workers." According to Drucker (1999), knowledge workers must manage themselves, be autonomous, continually innovate, continuously learn, and make quality more important than quantity. The organization must treat the employee as an "asset" rather than a "cost." The knowledge worker must want to work for the organization in preference to all other opportunities.

Fact	Knowledge workers are an asset to the organization.
Comparison	INDOT managers must not view training as a "cost," as is sometimes the case

Overall, INDOT managers realize that employees must enter the information age (and the Internet age), but they are still searching for programs to accomplish this.

Training Trends in the Private Sector

In the private sector, companies realize that a well-trained workforce is essential to remain competitive. Employees want to be associated with a business that is competitive, and hence the continuing education package offered by a company to employees signifies not only the commitment to individuals but also the company's commitment to remain competitive in the marketplace. Companies have been searching for the best and most efficient means for achieving their training goals.

As part of the commitment to continuous education, companies have made a financial commitment to employees through tuition reimbursement and other kinds of educational support. Companies have found that, when potential employees consider job offers, the ability to continue their education is a very important factor in deciding on an offer. In fact, companies rank continuing education just below health insurance as a desirable way to attract new employees. In the following boxes, INDOT programs are compared to these trends in the private sector.

Fact	More than 90% of companies rank continuing education just below health insurance as a desirable way to attract new employees.
Comparison	Some INDOT employees were not aware of the opportunities available to them in continuing their education. Marketing of programs within INDOT is needed.

Fact	The amount spent per employee on education in the private sector is $1526 each, with nearly half of corporate education budgets spent on professional and technical skills allowing companies to chalk up gains in productivity.
Comparison	INDOT spends about $650 per employee on education and training. Removing indirect costs for employees' salaries and travel costs, INDOT spends $168/employee/year.

Fact	Training could help in the retention of workers.
Comparison	If workers see self-improvement and perceive a commitment from INDOT for overall quality improvements, then they will be more likely to continue on their job.

Fact	85% to 90% of private companies have tuition-reimbursement programs. Most reimburse employees 100% tuition if employee receives an A or B in the class.
Comparison	INDOT reimburses employees 75% of tuition. For a Purdue engineering class, the tuition is $638 per course. INDOT would pay $486 of this; the employee would have to pay $152.

Many of the companies have been developing training programs in-house. In fact, a major trend is for private companies to start colleges or universities. One of the first companies to initiate this trend was Motorola. Many others have followed their lead. Through years of experience in these corporate universities, Bill Wiggenhorn, President of Motorola University, summarized the new view of education in a knowledge-based economy (see Table 1).

TABLE 1. Comparison of New and Old Views of Education

Old view	***New view***
Four-year Degree	Forty-year Degree
Training as a Cost Center	Training as #1 Source of Competitive Advantage
Learner Mobility	Content Mobility
Distance Education	Distributed Learning
Traditional Classroom & Correspondence	High-tech Multimedia
One-Size Fits All	Tailored Programs
Geographic Institutions	Brand Name University & Celebrity Professors
Just-in-Case	Just-in-Time
Isolated	Virtual Learning Communities

The new view of education recognizes that employees and employers need to commit themselves to continuous education. Education is not finished once the company hires an employee after completing a four-year college degree. Continuous training is essential for companies to achieve a competitive advantage.

In the past, the students had to travel to a site to receive their education, typically in a classroom setting. In the new view, the content is delivered to the students, often at their desktops. High-tech delivery techniques, such as the Internet or CD-ROMs, can deliver computer-based training to desktops. In the past, correspondence courses, using surface mail, allowed students to communicate with instructors. In the new view, communication through e-mail and videoconferencing allows for instantaneous communication to and from remote sites. Education no longer occurs at a distance; students feel that they are part of a distributed learning community.

Education is becoming unshackled from regional or geographical limitations. In the past, companies took the courses that were available from the local college or university, regardless of the quality of the course. In the new view, a few brand-name universities and celebrity professors may dominate in expertise areas based on content quality. All education providers will search for methods to tailor the programs to the needs of the organization.

Just as education is no longer limited by distance, time will no longer be a constraint. Typically, education has fit into specific time packages, such as semesters or quarters. Education was provided just in case it was needed at some later date. In the new view, education will be delivered at the time it is needed. In other words, education will be delivered to the students just in time.

Fact	The private sector is moving to a “new view” of education.
Comparison	INDOT managers recognize the need for high-tech multimedia training and tailored programs, but have not implemented many of the needed changes.

Training Trends in the Public Sector

The results of the benchmarking study, in which other DOTs were surveyed on their education needs, appears later in this report. Although benchmarking information is often difficult to obtain, that study contains some of the information that was retrieved from the other DOTs. In this section, perceptions and attitudes to education and training by public officials will be discussed. The results from the benchmarking will be reported in a later section.

Much of the information in this section was obtained from a questionnaire on education and training that was sent to all 50 state governors. Thirty-five governors responded to the questionnaire. Overall, the governors showed strong support for education and training, both in schools and businesses, within their state. Following are some of the results from that questionnaire.

The governors ranked development of job training and employment skills second in importance on their list of priorities. The top preference of the governors was to use technology to deliver more educational offerings and to meet increased demands for access to education (94% of the governors were supportive or very supportive of this strategy). The governors felt that students should be allowed to receive their education anytime, anyplace through technology (83% of the governors were supportive or very supportive of this strategy).

Education and Training at INDOT

In the past five years, the possibilities for providing training and education to employees have increased dramatically. Training is no longer constrained by space and time. With the proliferation of multimedia training materials, the quality of the training can increase, if done correctly, while it is delivered at a lower cost. More people have access to training programs.

Many organizations are struggling to determine how to increase training quality and, at the same time, reduce costs. Similar to these other organizations, this is an important time for INDOT to evaluate its present training program and consider possible new directions to utilize the new technologies of the past few years. Most of the INDOT managers interviewed for this study were aware of these new training trends and were interested in moving in these new directions.

The recommendations at the end of this report will move INDOT in these new directions. If the recommendations are followed, we believe that INDOT can increase the quality of its training, make training programs conveniently available to more employees, and reduce overall training costs.

Methodology

The following surveys were conducted to assess INDOT's training needs:

- Training costs survey
- Future training needs interview
- Training program survey
- Job inventory survey
- Benchmarking survey

Training Costs Survey

The purpose of the training costs survey was to assess the direct and indirect costs of the various categories of training. The surveys were sent to all division chiefs and district directors and were individualized for each division and district. Twelve of the 19 divisions/districts returned the surveys for a response rate of 63%.

Future Training Needs Interview

The purpose of the future training needs interview was to assess the satisfaction with current training programs and services, and to determine the likely impact of anticipated changes on training needs. The anticipated changes in job duties were also evaluated. This survey was conducted face to face with the division and district heads. All participated in this interview.

Training Program Survey

The purpose of the training program survey was to gather information about training programs not associated with the Training Section. Surveys and reminder letters were sent to those with training-related duties for each job across districts and divisions. This survey evaluated the following training issues:

- Supportiveness of job environments for use of new skills
- Duplication and coordination of specific training efforts across divisions and districts
- Training objectives and how well objectives were met
- How training programs are developed
- Training methods used
- Training program participation rates and costs
- How training needs are assessed
- How training programs are evaluated

The response rate was 26% (48 out of 187 responded).

Job Inventory Survey

Both job incumbents and supervisors of the job incumbents were contacted as part of this survey. For INDOT job duties, job incumbents were asked to assess the frequency of the tasks performed, the importance of tasks to the overall job, the level of skills required, and the type of training received in the last two years. Supervisors were asked to evaluate the performance of the job incumbents on the tasks and the availability of the

training for each of the tasks. The surveys were individualized for each job. Random samples of supervisors and job incumbents across divisions and districts were asked to participate in the study. Reminder letters were sent to all participants. The response rate was 43% (181 out of 418 responded).

Benchmarking Survey

Telephone interviews were conducted with the Training Directors of the state Departments of Transportation. See Appendix IX for the Training Director Interview. Twenty-five states participated in the interview. Initially, a representative of the research team attended the National Transportation Training Director's Conference to explain the study and solicit participation. Faxes and email messages were then sent requesting participation, and later followed up with reminder letters.

Part 1 of the table (pages 247-250) in Appendix X is a comparison of INDOT to the mean responses of the other 24 states to the interview questions. Standard deviations are also included as indicators of the spread of responses for the other 24 states. The column labeled "No. of states responding" indicates the number of Training Directors who provided information for each question in the interview. Part 2 of the table (pages 251-274) in Appendix X includes responses for individual states. The eight unidentified states wished to remain anonymous. Most of the empty cells indicate that the Training Director could not answer a question or did not wish to answer a question. In two instances, the Training Director wished budget and spending information to remain confidential, while granting us permission to identify the state.

The survey evaluated the

- State environments, such as relevant state laws and the labor market
- Organizational environments, such as the budget, structural characteristics, and demographics
- Training departments and practices, such as the budget, structural characteristics, training methods, needs assessment methods, and outcome assessment methods

Results of the Questionnaires and Surveys

Training Costs Survey for the Districts and Divisions

The purpose of the training costs survey was to assess the direct and indirect costs for the districts and divisions of the various categories of training. The surveys were sent to all division chiefs and district directors and were individualized for each division and district. Twelve of the 19 divisions/districts returned the surveys for a response rate of 63%. The results from this survey do not take into account the money spent on training through the centralized function of the Training Department.

Results

This section summarizes the results of the training costs survey. The questionnaire covers money spent on training-related items during fiscal year 1998 and money budgeted for the same during Fiscal Year 1999 for the districts and divisions (Appendix I shows a list of INDOT's divisions and districts).

The questionnaire asked respondents to separate training expenditures into three distinct categories, as indicated by the following table.

TABLE 2. Training Expenditure Categories.

Category 1 (Direct Cost)	***Category 2 (Direct Cost)***	***Category 3 (Indirect Cost)***
Anything related to training which you would write a check for out of your training budget (tapes, out-sourced training and development, classes, etc.)	Salaries of *full time* trainers in your department (if a *part-time* trainer reports salary as a percentage of the time spent performing training activities).	Accumulated salaries of employees being trained. For example, if an employee earns $26,000/yr and he or she is in training for one week, then report one week's salary *[$500]* for that employee.

To determine the relative confidence in responses, respondents were also asked to provide a number on a *subjectivity index* for each entry. A low number indicates a low confidence in the cost number provided; a high number indicates a high confidence. Figure 1 shows the subjectivity scale used.

1	2	3	4	5
I had to quess (no data)	Scientific guess (vague idea)	In the ballpark (+/- 25%)	Good Confidence (+/- 5%)	Complete accurate (complete data)

Figure 1. *Subjectivity index.*

Figure 2 shows a graph of the amount of money spent in 1998 in the different categories. This amount does not include the $600,000 that was budgeted directly to the Training Department for training. Tables 3 through 4 show the amount spent and budgeted on training by the divisions and districts in 1998, outside of the Training Department budget. Tables 5 through 8 breaks down the spending and budgets by type of training provided.

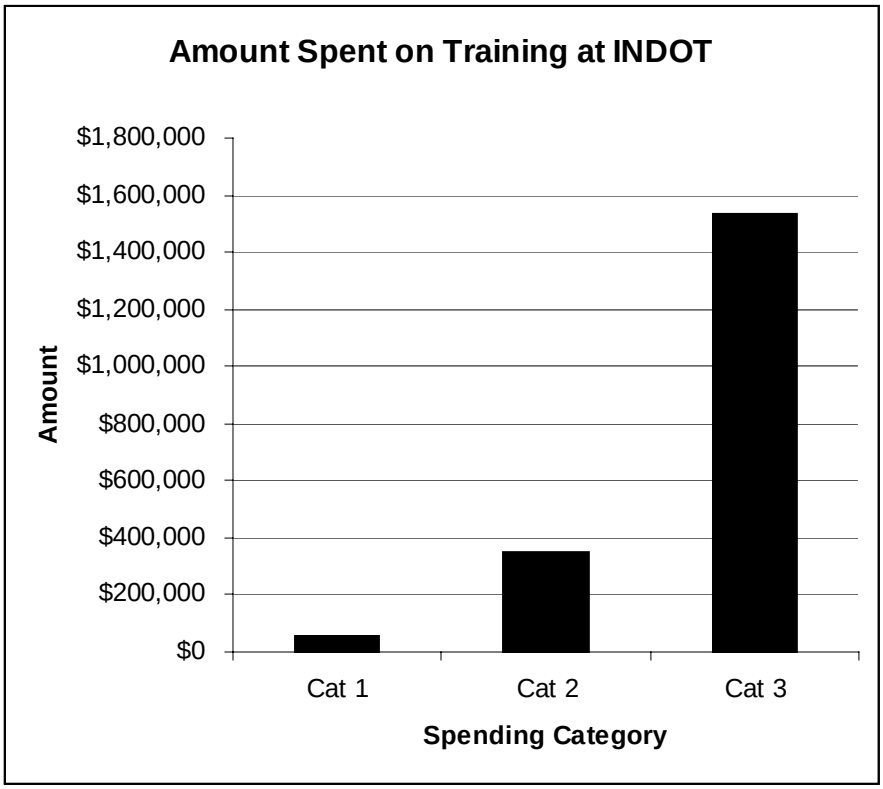

Figure 2. *Amount spent on training at INDOT in 1998.*

The amount of money spent on training in Category 1 would be increased from its current $56,644 to $656,644 if the money budgeted to the Training Department ($600,000) were included. The purpose of this questionnaire was to determine the amount of money spent by divisions and districts outside of the money allocated to the Training Department.

TABLE 3. Amount Spent in Fiscal Year 1998 Categorized by Division or District *(note: Toll Road Division categorized with districts)*

Division	Category 1	Category 2	Category 3	Sub. Index	
Policy and Budget	$0	$0	$24,000	2	
Accounting & Control	$0	$0	$1,208	2	
Materials & Test	$0	$39,600	$22,400	3.5	
Land Acquisition	$0	$0	$19,023	4	
Pre-Engr. & Environment	$595	$3,000	$10,140	1 to 3	
Roadway Mgmt	$925	$0	$13,320	1 to 3	
Research	$2,900	$7,600	$14,600	1 to 4	
Intermodal Trans.	$1,900	$0	$10,610	2 to 4	
Human Resources	$10,443	$74,922	$3,845	2 to 5	
Planning and Programming	$0	$0	$20,000	3 to 4	
Tech. Services Div.	$1,103	$0	$2,150	3 to 5	
Civil Rights				no report	
Design				no report	
Information Services				no report	
Legal				no report	
Public Affairs				no report	
Operations Support	$0	$0	$0	no budget	
TOTAL	**$17,866**	**$125,122**	**$141,296**		$284,284

District	Category 1	Category 2	Category 3	Sub. Index	
LaPorte	$0	$64,050	$294,500	1 to 3	
Fort Wayne	$0	$11,328	$124,425	2 to 3	
Seymour	$0	$0	$107,700	2 to 4	
Greenfield	$0	$11,600	$276,939	1 to 5	
Vincennes	$1,360	$62,600	$234,000	1 to 4	
Crawfordsville	$0	$42,000	$220,000	1 to 4	
Toll Road	$37,418	$31,426	$137,797	1 to 4	
TOTAL	**$38,778**	**$223,004**	**$1,395,361**		$1,657,143
Total Division + Districts	**$56,644**	**$348,126**	**$1,536,657**		

Grand Total **$1,941,427**

Category 1 (direct training costs) excluding training section budget = $56,644.
Category 2 (direct training costs for trainers) = $348,126.
Category 3 (indirect costs – employee salaries) = $1,536,657.

Notice the disparities among the Districts in training spending. For example, Laporte spent $358, 550, while Seymour spent $107,700.

TABLE 4. Amount Budgeted in Fiscal Year 1998 Categorized by Division or District *(note: Toll Road Division categorized with districts)*

Division	Category 1	Category 2	Category 3	Sub. Index	
Policy and Budget	$0	$0	$24,000	2	
Accounting & Control	$0	$0	$1,208	2	
Materials & Test	$0	$39,600	$22,400	3.5	
Land Acquisition	$0	$0	$19,023	4	
Pre-Engr. & Environment	$595	$3,000	$10,140	1 to 3	
Roadway Mgmt	$925	$0	$13,320	1 to 3	
Research	$2,900	$7,600	$14,600	1 to 4	
Intermodal Trans.	$1,900	$0	$10,610	2 to 4	
Human Resources	$10,443	$74,922	$3,845	2 to 5	
Planning and Programming	$0	$0	$20,000	3 to 4	
Tech. Services Div.	$1,103	$0	$2,150	3 to 5	
Civil Rights				no report	
Design				no report	
Information Services				no report	
Legal				no report	
Public Affairs				no report	
Operations Support	$0	$0	$0	no budget	
TOTAL	**$17,866**	**$125,122**	**$141,296**		$284,284

District	Category 1	Category 2	Category 3	Sub. Index	
LaPorte	$0	$64,050	$294,500	1 to 3	
Fort Wayne	$0	$11,328	$124,425	2 to 3	
Seymour	$0	$0	$107,700	2 to 4	
Greenfield	$0	$11,600	$276,939	1 to 5	
Vincennes	$1,360	$62,600	$234,000	1 to 4	
Crawfordsville	$0	$42,000	$220,000	1 to 4	
Toll Road	$37,418	$31,426	$137,797	1 to 4	
TOTAL	**$38,778**	**$223,004**	**$1,395,361**		$1,657,143
Total Division + Districts	**$56,644**	**$348,126**	**$1,536,657**		
GRAND TOTAL	**$1,941,427**				

TABLE 5. Amount Divisions Spent on Different Training Types in Fiscal Year 1998

Division	Computers	Employee Dev.	Division Specific	Sub. Index
Policy and Budget	$0	$8,000	$16,000	2
Accounting & Control	$0	$0	$1,208	2
Materials & Test	$1,000	$4,600	$56,400	3.5
Land Acquisition	$0	$0	$19,023	4
Pre-Engr. & Environment	$0	$0	$13,735	1 to 3
Roadway Mgmt	$6,000	$0	$8,145	1 to 3
Research	$2,600	$3,400	$19,100	1 to 4
Intermodal Trans.	$0	$0	$12,510	2 to 4
Human Resources	$2,353	$5,893	$80,964	2 to 5
Planning and Programming	$7,500	$7,500	$5,000	3 to 4
Tech. Services Div.	$0	$2,553	$700	3 to 5
Toll Road	$0	$0	$206,641	1 to 4
Civil Rights				no report
Design				no report
Information Services				no report
Legal				no report
Public Affairs				no report
Operations Support	$0	$0	$0	reported no budget
TOTAL	**$19,453**	**$31,946**	**$439,426**	
GRAND TOTAL	**$490,825**			

Note: *"Division Specific"* refers to training costs specific to that division's needs. For example, division-specific categories for Human Resources include compensation/employment, labor relations, and trainer training

Almost half ($206,641) of Division specific training was for the toll road.

Division specific training ranged from $700 spent by technical services to $80,000 spent by human resources. More analysis should be performed to determine the reason for these disparities.

TABLE 6. Amount Divisions and Districts Budgeted on Different Training Types in Fiscal Year 1998

Division	Category 1	Category 2	Category 3	Sub. Index
Planning and Programming	$0	$0	$20,000	3 to 4
Pre-Engr. & Environment	$700	$3,000	$1,000	2 to 5
Land Acquisition	$0	$0	$1,550	2
Tech. Services Div.	$1,000	$0	$2,200	4 to 5
Policy and Budget	$0	$0	$24,000	2
Materials & Test	$0	$39,600	$22,400	3.5
Research	$6,000	$8,900	$16,000	1 to 4
Accounting & Control	$0	$0	$1,268	2
Intermodal Trans.	$1,900	$0	$10,610	2 to 4
Operations Support	$0	$0	$0	
Roadway Mgmt	$925	$0	$13,320	1 to 3
Civil Rights				no report
Design				no report
Human Resources	$5,299	$78,043	$3,365	2 to 5
Information Services				no report
Legal				no report
Public Affairs				no report
TOTAL	**$15,824**	**$129,543**	**$115,713**	

District	Category 1	Category 2	Category 3	Sub. Index
LaPorte	$0	$64,050	$294,500	1 to 3
Fort Wayne	$0	$11,328	$124,425	2 to 3
Seymour	$0	$0	$107,700	2 to 4
Greenfield	$0	$11,600	$276,324	1 to 5
Vincennes	$1,360	$98,600	$434,000	1 to 4
Crawfordsville	$0	$42,000	$220,000	1 to 4
Toll Road	$37,418	$31,426	$137,797	1 to 4
TOTAL	**$38,778**	**$259,004**	**$1,594,746**	
Total Division + District	**$54,602**	**$388,547**	**$1,710,459**	
GRAND TOTAL	**$2,153,608**			

TABLE 7. Amount Districts Spent on Different Training Types in Fiscal Year 1998

Division	Crawfordsville	Fort Wayne	Greenfield	LaPorte	Seymour	Vincennes	totals
Safety	$120,000	$32,226	$134,026	$171,000	$23,600	$34,000	$514,852
Road Maintenance	$11,000	$34,992	$20,123	$6,050	$8,500	$5,600	$86,265
Winter Maintenance	$9,000	$21,870	$43,294	$9,300	$0	$5,600	$89,064
ROW and Rest Area Maint.	$10,000	$0	$10,000	$800	$0	$0	$20,800
Equipment	$4,600	$3,456	$20,000	$800	$3,500	$4,600	$36,956
Environmental	$4,600	$1,560	$20,000	$800	$575	$4,360	$31,895
Construction	$55,000	$38,949	$13,000	$25,000	$60,000	$110,000	$301,949
Traffic Control	$0	$0	$20,484	$0	$0	$13,200	$33,684
Accounting & Procurement	$1,000	$0	$10,000	$800	$150	$3,200	$15,150
Bridge & Pavement Insp.	$1,000	$0	$5,500	$0	$0	$1,000	$7,500
Land Acquisition	$0	$0	$500	$0	$0	$0	$500
Planning & Development	$0	$0	$2,200	$0	$0	$3,500	$5,700
Computers	$25,000	$2,700	$12,354	$26,400	$4,600	$70,100	$141,154
Personnel Management	$5,000	$0	$0	$6,400	$1,000	$32,100	$44,500
Other	$15,800	$0	$41,325	$111,200	$2,000	$8,000	$178,325
TOTAL	**$262,000**	**$135,753**	**$352,806**	**$358,550**	**$103,925**	**$295,260**	**$1,508,294**

GRAND TOTAL **$1,508,294**

Notice the disparities in spending. For example, LaPorte spent 8 times what Seymour did on safety and Vincennes spent 9 times what Greenfield spent on construction training.

TABLE 8. Amount Districts Budgeted on Different Training Types in Fiscal Year 1998

Division	Crawfordsville	Fort Wayne	Greenfield	LaPorte	Seymour	Vincennes	Totals
Safety	$120,000	$32,226	$56,569	$171,000	$26,000	$34,000	$439,795
Road Maintenance	$11,000	$34,992	$20,400	$6,050	$9,000	$5,600	$87,042
Winter Maintenance	$9,000	$21,870	$43,700	$9,300	$0	$5,600	$89,470
ROW and Rest Area Maint.	$10,000	$0	$10,000	$800	$0	$0	$20,800
Equipment	$4,600	$3,456	$20,000	$800	$4,000	$4,600	$37,456
Environmental	$4,600	$1,560	$20,000	$800	$500	$4,360	$31,820
Construction	$55,000	$38,949	$0	$25,000	$0	$110,000	$228,949
Traffic Control	$0	$0	$20,300	$0	$60,000	$13,200	$93,500
Accounting & Procurement	$1,000	$0	$10,000	$800	$200	$3,200	$15,200
Bridge & Pavement Insp.	$1,000	$0	$5,500	$0	$0	$1,000	$7,500
Land Acquisition	$0	$0	$500	$0	$0	$0	$500
Planning & Development	$0	$0	$3,000	$0	$0	$3,500	$6,500
Computers	$25,000	$2,700	$17,855	$26,400	$4,000	$306,100	$382,055
Personnel Management	$5,000	$0	$10,400	$6,400	$1,000	$32,100	$54,900
Other	$15,800	$0	$46,300	$111,200	$3,000	$8,000	$184,300
TOTAL	**$262,000**	**$135,753**	**$284,524**	**$358,550**	**$107,700**	**$531,260**	**$1,679,787**

GRAND TOTAL **$1,679,787**

Discussion

For the districts and divisions, most of the cost of training (79%) is due to the salaries of employees during the training process. Very little is spent on direct costs. The amount spent per employee on education in the private sector is $1526 each. Taking into account all three categories of costs, the divisions and districts spend about $496/employee/year(using 3900 as the number of employees). Removing the category 3 indirect costs, the divisions and districts spend $103/employee/year. Taking into account the budget for the Training Department, INDOT spends about $650/employee/year. Removing categories 2 & 3 costs and including the Training Section budget, INDOT spends about $168/employee/year.

Future Training Needs Interview

The purpose of the future training needs interview was to assess the satisfaction with current training programs and services, and to determine the likely impact of anticipated changes on training needs (see Appendix II for the form used in the interview). The anticipated changes in job duties were also evaluated. This survey was conducted face to face with the 19 division chiefs and six district heads. All participated in this interview.

Results

Each question is outlined with division/district responses broken down into the following categories: *Districts & Toll Road*, *Non-Technical/Support Divisions*, and *Technical Divisions*. Patterns emerged in responses that fell along these lines. Table 9 shows the districts and divisions participating in this study.

TABLE 9. Districts and Divisions Participating in the Interviews.

Districts & Toll Road	Administrative & Support Divisions	Technical Divisions
Toll Road	Land Acquisition	Research
Ft. Wayne	Human Resources	Materials & Test
Crawfordsville	Legal	Info. Services
Seymour	Internal Affairs	Intermodal Trans.
Greenfield	Civil Rights	Design
Vincennes	Policy and Budget	Tech. Services
La Porte	Roadway Mgmt.	
	Operations Support	
	Public Affairs	
	Accounting and Control	
	Training	
	Planning & Programming	

The results from this questionnaire are summarized in the following tables according to the questions asked. Questions 1 through 5, summarized in Tables 10 through 14, addressed basic questions about the amount and type of training performed in the districts and divisions.

TABLE 10. Averages of Responses from Question 1 *(Approximately how many people require formal training on an annual basis in your division/district?)*

Districts & Toll Road	Administrative & Support Divisions	Technical Divisions
496.6	37.4	67.5

TABLE 11. Responses from Question 2 *(In general, what are the most frequent training activities that go on in your division/district?) (Interviewees were asked to provide their top-three training activities.)*

Ranking	**Districts & Toll Road**	**Administrative & Support Divisions**	**Technical Divisions**
First	Safety	Computer Applications	Computers (Applications and Technical)
Second	Certification	Division-Specific Skills	Technical Division-Specific Skills
Third	Maintenance/On-the-Job Training	Diversity/Sexual Harassment, etc.	Administration/Clerical

TABLE 12. Averages of Responses from Question 3 *(How much of the training is done in house? Out Sourced? Schools/Classes? Video? Give your best % estimate.)*

Source	**Districts & Toll Road**	**Administrative & Support Divisions**	**Technical Divisions**
In-house	54.3%	33.5%	34.2%
Out-sourced	8.25%	13.0%	10.0%
Schools/Classes	16.3%	52.0%	52.5%
Media	17.0%	1.5%	3.33%

TABLE 13. Responses from Question 4 *(How do you currently assess the effectiveness of your training?)*

Districts & Toll Road	**Administrative & Support Divisions**	**Technical Divisions**
All divisions and districts reported very little follow-up for training effectiveness beyond informal observation and "lack of complaints."		

TABLE 14. Responses from Question 5 *(What kind of additional training would increase the performance of your division/district (outside of HR training services)?)*

Districts & Toll Road	Administrative & Support Divisions	Technical Divisions
• Certified Maintenance Training Programs (parallel to certified tech.) • Encourage more involvement with SAE • More computer and Internet training for clerical staff and office personnel • Supervisory/leadership training • More formalized material/equipment training	• Project and Time management training (Gantt charting, etc) • More specialized computer training. • Training in laws (old and new) affecting INDOT • More effective trading of ideas/networking • Continuing Education/Tuition reimbursement more encouraged • Electronic media/HTML • Technical writing	• Continuing Education/Tuition reimbursement • More specialized computer training • Providing more money and time for national conferences and workshops • Electronic media/HTML • More computer and Internet training for clerical staff • Bookmarkable, CD-ROM-based training in a variety of areas • Use web to deliver orientation training information • Develop technical training tools for OJT.

Questions 6 to 8 evaluated attitudes towards the training services provided to the districts and divisions. Interviewees responded using a 5-point Likert scale where 5 was very satisfied, 3 was neutral, and 1 was very dissatisfied. The results are summarized in Table 15.

TABLE 15. Averages of Responses from Questions 6 to 8 *(What are your feelings/attitudes towards the training services provided to your division/district by (6) Human Resources, (7) Vendors/Consultants, (8) Training internal to your own division/district?)*

Source	**Districts & Toll Road**	**Administrative & Support Divisions**	**Technical Divisions**
Human Resources	3.83 (7 of 7)*	3.80 (10 of 12)*	4.00 (6 of 6)*
Vendors/Consultants	3.83 (7 of 7)*	3.54 (12 of 12)*	4.00 (5 of 6)*
Internal Training	3.67 (7 of 7*)	4.00 (4 of 12)*	4.25 (4 of 6)*

***Average ("# reporting" of "number division/district in category")** If the division/district did not report, then they indicated they received no training services from the specified source. Nonreporting divisions/districts are not included in the calculation of the averages.

Questions 9 through 14 queried the managers about how they see their jobs evolving and how this will affect their training needs in the future. In this summary, each category will be discussed one at a time in its entirety. In the interview, interviewees were asked to break down answers into time periods (e.g., in the next year, in the next 2 to 4 years, beyond 4 years). Few differences were seen between the time periods. In reporting the results, all three time periods at once are combined. Results are summarized in Tables 16 through 22.

TABLE 16. Responses from Questions 9, 12, and 15 *(How do you see the jobs changing or evolving?)*

Districts & Toll Road	**Administrative & Support Divisions**	**Technical Divisions**
• More demand upon employees and management • More technical equipment/products/ materials to work with • Increase in regulations and restrictions (IOSHA, DNR, IDEM) • Downsizing will continue • New software and ITS will become more important • More reliance upon technology-based management systems (accounting, scheduling, management software, etc.)	• Downsizing and attrition will continue • Special, division-related programs will come online • Increased use of multimedia and the internet; more complex computer applications or programs will be in use • Anticipated increase in interfacing with other divisions for resources and assistance	• New, specific technical programs will come online • Downsizing and attrition will continue • Increased use of multimedia and the internet; more complex computer applications or programs will be in use

TABLE 17. Responses from Questions 10, 13, and 16 *(How will these affect the job?)*

Districts & Toll Road	Administrative & Support Divisions	Technical Divisions
• More demand upon employee (from downsizing and increased responsibility) • More employees per manager • Increased need for communication and technical skills • Better planning skills required • Turnover rate will increase with no change in salary and increased responsibility • All employees will need to be computer literate (many are intimidated by technology) • Need for all around "better-prepared employee"	• More out-sourced work will be sought • Increased workload, responsibility and liability for individuals	• Workers will have to learn new systems / ways of doing things • Increased workload, responsibility and liability for individuals • Workers will have to learn how to prioritize

TABLE 18. Responses from Questions 11, 14, and 17 *(How will this impact training?)*

Districts & Toll Road	Administrative & Support Divisions	Technical Divisions
• Increased need for cross-training • Need to encourage learning and reward utilization of acquired skills • Increased need for computer skills and professional development • Increased need for time management and people management skills • Increased need for efficient delivery of training	• Time and project management training will become more important • More reliable, customizable, and timely computer courses will be needed with more choices and competency levels • How to handle stress will have to become part of the training curriculum.	• Time and project management training will become more important • More reliable, customizable, and timely computer courses will be needed with more choices and competency levels • Attendance at national conferences should be encouraged more • Increased need for continuing education • Need to encourage learning and reward utilization of acquired skills • Increased need for efficient delivery of training

TABLE 19. Responses from Question 18 *(What do you consider to be your division/district's "Best Practices" as far as training is concerned?)*

Results Summarized for All Districts/Divisions
• Design division puts current information that can be used by other workers within the division on the intranet • Land Acquisition division's mentorship program and new employee orientation • Human Resources training team's dissemination of training throughout the group • Human Resources training team's proactive approach to addressing training needs within their own group • Operation Support division's method of informing employee's of training availability • Greenfield district's safety training and cross-training practices • Ft. Wayne district feels that their computer training and leadership training is excellent and could be used as a model for others • Seymour district's OJT. Provides more control and involvement for employee and gives district more control over their needs

TABLE 20. Responses from Question 19 *(What do you feel your division/district could do more effectively in terms of training?)*

Results Summarized for All Districts/Divisions
• Increased availability and frequency of key training (computers, time management, etc.) • More "higher level" computer training. Current lessons not structured well for individuals who currently have adequate computer skills, but wish to learn more complicated, higher level computer skills • Increase management support of training • Increase communications between departments to share knowledge • Increase the efficiency and "applicability" of training and its delivery • More training follow up is needed • Break down barriers between districts/division. Encourage and teach collaboration • Increase technical training and dissemination

TABLE 21. Responses from Question 20 *(Do you see a role for multimedia and computers in your division/district's future training activities (CAI, internet, etc.)?)*

Results Summarized for All Districts/Divisions
All divisions and districts except one answered this question with a big *"YES."* Districts feel that it is a cheap and effective way of disseminating training to their field offices while cutting back on travel and lost work costs. It also allows employees to take control of their own training and work at their own pace. Divisions tended to view it the same way, however, their focus was more on using it to teach computer applications and diversity while the districts saw potential in technical- and maintenance-related training.

Training Program Survey

The purpose of the training program survey was to gather information about current formal training programs available to INDOT employees but not associated with the Training Section. Surveys and reminder letters were sent to those with training-related duties for each job across districts and divisions. This survey evaluated the following training issues:

- Supportiveness of job environments for use of new skills
- Duplication and coordination of specific training efforts across divisions and districts
- Training objectives and how well objectives are met
- How training programs are developed
- Training methods used
- Training program participation rates and costs
- How training needs are assessed
- How training programs are evaluated

The respondent names came from the job inventories on a question asking for the primary training contact for that job category. At least one training questionnaire was sent to a representative from all job categories. A total of 187 questionnaires were mailed representing 110 job categories. Of those sent out, we received 48 back, covering 33 job categories, for a response rate of 25.6%. Of those who responded, 17 sent theirs back blank citing that their division/district has no formal training programs to report for that particular job category. Reminder letters were sent approximately one week after the due date to all non-respondents.

A copy of the questionnaire is contained in Appendix III.

Table 22 shows the responsibilities of the respondents at INDOT.

TABLE 22. Training-Related Responsibilities

% Responding	Training-Related Responsibilities
53.1%	Administration of training programs (e.g., scheduling, organizing, purchasing, granting permission to take courses).
16.3%	Instructional design
26.5%	Choosing "off-the-shelf" training programs or materials
28.8%	Working with vendors to develop training programs or materials.
51.0%	Determining what skills need to be trained
61.2%	Determining which employees need to be trained
42.9%	Assessing training program effectiveness
28.6%	Teaching
16.32%	Other. Please describe

Who Teaches?

The next set of questions determined characteristics of the trainers. Table 23 shows who teaches the training programs and Table 23 provides data on how INDOT employers are selected as trainers.

TABLE 23. Who Teaches the Training Programs?

% Courses	Who Teaches
50.0%	INDOT staff
14.9%	Consultant
25.7%	Vendor
20.3%	Government agency
12.2%	Other

Overall, 18.9% of the courses use more than one of the above categories when taught. Vendors or consultants teach 28.5% of the courses (the last percentage does not correspond to the table percentage due to courses being taught by multiple types).

One question addressed the basis on which INDOT employees were selected to teach training courses. Table 24 summarizes the results (responses were collected using a 5-point Likert scale where "1" was "not at all" and "5" was "completely").

TABLE 24. Selection Basis for INDOT Employees Teaching Courses

Response	Selection Basis
3.4	Teaching Skill
3.8	Technical Skill
3.8	Interest in Doing the Course

To help the trainers teach the courses, INDOT offers a "Train the Trainer" course in which 45.8% of the trainers participated. These trainers gave the "Train the Trainer" course a rating of 2.9 on a 5-point Likert scale ("1" was "not at all" and "5" was "completely").

Transfer Environment

Twenty-five questions addressed the extent to which training is supported in the job environment (refer to Appendix III for a complete list of the questions). The 25 questions can be grouped into five categories to find overall scores. Respondents used a five-point Likert scale in which "1" was "Very Infrequently" and "5" was "Very Frequently." Table 25 summarizes the results.

TABLE 25. Supportiveness of the Transfer Environment

Mean Response	How Often Does Employees Receive?	Question Numbers
2.4	Rewards for training provided	23, 24, 25
1.7	Obtaining training and use of new skills discouraged	2, 6, 7, 9, 11, 18
3.6	Use of new skills facilitated by job	20, 21, 22
3.7	Supervisor support for obtaining training and using new skills	1, 3, 4, 5, 8, 10, 12, 13, 14, 15
3.8	Co-worker support for obtaining training and using new skills	16, 17, 19

Looking across all job categories, significant trends occurred. Employees receive few incentives for participating in training programs across INDOT. When asked if trainees received monetary rewards, the average response was 1.2. When asked if trainees are given preference for promotions, the average response was 2.8.

Questions with scores in the midrange are: "training aids are available on the job to support the use of new skills" *(Ave. 3.3)*; "supervisors help trainees set realistic goals for job performance based on their training" *(Ave. 3.5)*, "supervisors have trainees share their training experience and learning with co-workers" *(Ave. 3.417)*; and "supervisors ease the pressures of work for a short time so trainees have a chance to practice their new skills" *(Ave. 3.000)*.

Training Dissemination & Coordination

Overall, INDOT exhibits a lack of coordination between the divisions and districts. Even though 71.23% of training programs at INDOT are taught at multiple divisions or districts, these training programs are not typically shared. Table 26 shows the amount of coordination that takes place ("1" is "None" and "5" is a "A Great Deal").

TABLE 26. Coordination of Effort

Mean Response	Coordination of Effort
2.7	Conducting a training needs analysis
2.6	Instructional design
2.0	Monetary cost sharing
2.3	Teaching-the-trainer program

Characteristics of the Training Program

Several questions addressed the characteristics of the training program. Table 27 shows the responses for the length of training, Table 28 shows the training methods used, and Table 29 shows the source of funding. Table 30 shows the training sources. Table 31 shows how training is assessed.

TABLE 27. Length of Training Program

%	Response
13.5	Too short
85.1	Appropriate length
1.4	Too long

TABLE 28. Training Method

%	Training Method
82.4	Lecture
60.8	Video
48.6	Case Studies
32.4	Simulation
25.7	Self-Directed Learning Modules
9.5	Other
9.5	CD-ROM
8.1	Distance Learning
2.7	Web-Based Instruction

Of those listed in the above table, 86.5% used multiple methods.

TABLE 29. Training Funding Source

%	Percent Training Funding from Human Resources
9.6	Left Blank
62.0	Do Not Know
6.8	100%
21.6	0%

TABLE 30. Sources of Training Programs/Courses

%	Where Developed
51.4	In-house by your department or some other department
17.6	Purchased of the shelf
10.8	Purchased, but tailored to INDOT's needs
20.3	Did not Specify

TABLE 31. Assessment of Training Effectiveness

%	Assessment Methods
68.9	Trainee Reactions
36.5	Self-Evaluations Back on the Job
35.1	Supervisor Performance Evaluations Back on the Job
33.8	Knowledge Tests
27.1	Work Samples at the End of Training
13.5	Evaluations by Trainer Back on the Job
6.8	None
4.1	Other

The respondents reported that 63.51% of training programs use multiple evaluation methods.

The following training programs implemented more than four different evaluation methods to get feedback, establish transfer of training, etc. These could possibly be valuable programs for benchmarking.

TABLE 32. Training Programs Using Multiple Evaluation Methods

Training Program	Job Category
Backflow Device Technician Training	Maintenance Repair 2
Advocacy (Arbitration) Training	Employee Relations Specialist
Ethics for managers/supervisors	Employee Relations Specialist
District Herbicide Training	Highway Maintenance Worker 3
Maintenance Management System	Management Analyst 3

Respondents provided us with objectives and some lesson plans. The results from this questionnaire and lesson plans, broken down by job category, is included under a separate cover entitled “Training Questionnaire and Current Programs.”

Job Inventory Survey

Both job incumbents and supervisors of the job incumbents were contacted as part of this survey. For INDOT job duties, job incumbents were asked to assess the frequency of the tasks performed, the importance of tasks to the overall job, the level of skills required, and the type of training received in the last two years. Supervisors were asked to evaluate the performance of the job incumbents on the tasks and the availability of the training for each of the tasks. The overall purpose of this study is to provide data on which to base recommendations to INDOT about where to focus its training efforts.

The surveys were individualized for each job. Respondents were chosen at random on the basis of organizational charts provided by INDOT. A minimum of four questionnaires was sent for each job category. This criterion was largely met. The only exceptions were jobs where a) the number of employees was less than four and b) positions were vacant. A maximum number of thirty questionnaires was set for each job category. Again, this was largely met, except in jobs where sub-specialization was noted, in which case the number of questionnaires sent out increased accordingly. Random samples of supervisors and job incumbents across divisions and districts were asked to participate in the study. Reminder letters were sent to all participants.

Separate questionnaires were prepared for job incumbents and supervisors, and were sent to respondents via US mail. Completed questionnaires were sent to the Purdue Research Team. A total of 481 questionnaires were sent out and 212 responses were received. Of these responses, 31 questionnaires were returned uncompleted. Therefore, 181 responses were useable, giving us a response rate of 37.6%.

Some of the jobs were performed by a large number of employees, particularly in the districts. In these cases, given the similarities in organizational structure, it was assumed that employees perform similar duties. For these jobs, data from job incumbents were collected from only one district. However, since the performance of employees in these jobs could differ across districts, questionnaires were sent to supervisors in all districts. In jobs that were performed by a small number of employees, care was taken to sample employees in every district. While the bulk of INDOT employees have been included in the job inventory survey, several jobs were excluded because job descriptions were not available for those jobs. A list of these jobs is available in Appendix IV. In addition, jobs with three or fewer employees were excluded from the job inventory. A list of these jobs is available in Appendix V. Tables 33–39 summarize the incumbents in each job, the number of questionnaires sent out to incumbents, and the number of responses we received for the different job codes.

The questionnaires for the incumbents and job supervisors are shown in Appendices VI and VII.

TABLE 33. Code 1 Jobs

Code 1 jobs	**Job Title**	**No. of incumbents**	**No. of questionnaires sent**	**No. of responses**
1 AA 2	Administrative Analyst 2	8	4	1
1 AC 3	Systems Analyst	18	6	0
1 AB 4	Senior Programmer	10	4	1
1 AF 3	Software Specialist 3	5	4	2
1 CB 5	Statistician 5	5	8	0
1 DC 1	Highway Engineer 1	25	6	1
1 DC 2	Highway Engineer 2	64	9	3
1 DC 3	Highway Engineer 3	157	30	11
1 DS 2	Surveyor 2	8	8	5
1 DS 6	Surveyor 6	20	6	0
1 DT 2	Engineering Specialist 2	6	4	2
1 DZ 3	Construction Engineer 3	155	16	5
1 FB 4	Landscape Architect 4	6	4	0
1 LS 3	Environmental Scientist 3	14	8	2

TABLE 34. Code 2 Jobs

Code 2 jobs	**Job Title**	**No. of incumbents**	**No. of questionnaires sent**	**No. of responses**
2 LA 3	Information Specialist 3	4	4	2
2 LG 5	Art Illustrator 5	4	4	1
2 NB 1	Personnel Officer 1	4	4	1
2 NB 3	Personnel Officer 3	4	4	2
2 RA 2	Accountant 2	5	5	1
2 RA 3	Accountant 3	7	4	1
2 RA 6	Accountant 6	15	5	1
2 RB 3	Auditor Examiner 3	6	4	0
2 SA 1	Development Specialist 1	22	6	2
2 TT 2	Appraiser 2	13	6	1
2 TT 3	Appraiser 3	14	6	1
2 WM 3	Program Coordinator 3	23	8	8
2 WM 4	Program Coordinator 4	20	6	1
2 WM 5	Program Coordinator 5	11	5	3
2 WQ 3	Subdistrict Manager	37	8	5

TABLE 35. Code 3 Jobs

Code 3 jobs	**Job Title**	**No. of incumbents**	**No. of questionnaires sent**	**No. of responses**
3 AA 2	Draftsman 2	23	3	0
3 AA 3	Draftsman 3	9	3	1
3 AB 1	Engineering Assistant 1	573	46	19
3 KB 3	Field Investigator 3	60	8	5
3 LC 3	Personnel Technician 3	6	4	1
3 MB 3	Secretary 3	25	6	4
3 MB 4	Secretary 4	78	13	6
3 PA 3	Stores Clerk 3	49	7	6
3 PA 4	Stores Clerk 4	9	4	2
3 PA 5	Stores Clerk 5	2	2	1
3 OB 2	Telecom Operator 2	6	4	0
3 OS 4	Switchboard Operator 4	2	1	0
3 OS 5	Switchboard Operator 5	34	5	1
3 LD 3	Clerical Assistant 3	67	11	5
3 LD 4	Clerical Assistant 4	57	10	6
3 LD 5	Clerical Assistant 5	6	4	1
3 PA 3	Stores Clerk 3		49	6
3 PA 4	Stores Clerk 4		9	4
3 PA 5	Stores Clerk 5		2	2

TABLE 36. Code 4 Jobs

Code 4 jobs	**Job Title**	**No. of incumbents**	**No. of questionnaires sent**	**No. of responses**
4 GA 1	Electronics Technician 1	17	6	0
4 GA 2	Electronics Technician 2	36	6	0
4 IA 2	Maintenance Repair 2	18	6	4
4 IA 3	Maintenance Repair 3	13	5	2
4 MB 2	Highway Maintenance Worker 2	213	12	4
4 MB 3	Highway Maintenance Worker 3	1605	24	9

TABLE 37. Code 6 Jobs

Code 6 jobs	**Job Title**	**No. of incumbents**	**No. of questionnaires sent**	**No. of responses**
6 DC 4	Highway Engineer S4	49	20	13
6 DC 5	Highway Engineer S5	40	10	7

TABLE 38. Code 8 Job

Code 8 jobs	**Job Title**	**No. of incumbents**	**No. of questionnaires sent**	**No. of responses**
8 AB 3	Engineering Assistant S3	2259	31	17

TABLE 39. Code 9 Job

Code 9 jobs	**Job Title**	**No. of incumbents**	**No. of questionnaires sent**	**No. of responses**
9 GA 4	Electronics Technician S4	6	4	1
9 MB 4	Highway Maintenance S4	18	3	1
9 MB 5	Highway Maintenance S5	125	15	5

A response rate of 27.6% occurred (481 questionnaires were sent out and 181 responses were received).

In some cases, the job duties across jobs were similar enough for the analysis of the jobs to be presented in a single table. These jobs are shown in Table 40.

TABLE 40. Jobs Containing a Significant Overlap

Job Duties Combined	**Jobs Combined**
2 TT 2 and 3	Appraiser 2 and 3
3 AA 2 and 3	Draftsman 2 and 3
3 MB 3 and 4	Secretary 3 and 4
3 PA 3, 4 and 5	Stores Clerk 3, 4 and 5
3 LD 3, 4 and 5	Clerical Assistant 3, 4 and 5
4 IA 2 and 3	Maintenance Repair 2 and 3
4 MB 2 and 3	Highway Maintenance Worker 2 and 3
9 MB 4 and 5	Highway Maintenance S4 and S5

For some jobs, the duties performed varied greatly across divisions and/or districts. In those cases where information about such variance was provided to us (notably from the Design Division) we were able to create separate questionnaires for subspecialties within the job. These jobs are shown in table 41.

TABLE 41. Jobs that Required Subcategorization

Job Code	**Job Title Subcategorization**
3 AB 1	Engineering Assistant 1 (general) Design Division, Consultant Services Unit Design Division, Traffic Design Unit Design Division, Engineering Unit
6 DC 4	Highway Engineer S4 (general) Design Division, Traffic Design Unit Design Division, Bridge Rehabilitation Unit
8 AB 3	Engineering Assistant S3 (general) Design Division, Plan Development Section

Results

The following tables summarize the data received on the kind of training associated with each job. The most common form of training reported was on-the-job (OJT) training, followed by a combination of formal training (FT) and OJT training. The following tables provide information on the percentage of duties performed by INDOT employees that record an incidence of Formal Training (FT), On-the-Job Training (OJT), a combination of FT and OJT, and No Training (NT). Since there are differences in the kinds of training provided across INDOT divisions and districts, the total number of times that incidences of the various types of training were reported usually sums to a number greater than the total number of duties performed.

Training Received

The full results of the survey, broken down by job and tasks within the job, are contained in Appendix VIII. A summary of these results is shown in the following Tables 42 through 49.

TABLE 42. Incidence of Kinds of Training Reported for Duties Performed by INDOT Employees in Code 1 Jobs

Code	Job Title	FT	OJT	FT & OJT	NT
1 AA2	Administrative Analyst 2		2	4	
1 AB4	Senior Programmer		4		
I AF 3	Software Specialist 3	3	4		7
1 DC1	Highway Engineer 1		4	5	1
1 DC2	Highway Engineer 2		9		1
1 DC 3	Highway Engineer 3		10	7	7
1 DS 2	Surveyor 2	3	11	14	1
1 DT 2	Engineering Specialist 2		9	7	8
1 DZ 3	Construction Engineer 3		17	13	8
1 LS 3	Environmental Scientist 3		6		1
Total		**6**	**76**	**50**	**34**

TABLE 43. Incidence of Kinds of Training Reported for Duties Performed by INDOT Employees in Code 2 Jobs

Code	Job Title	FT	OJT	FT & OJT	NT
2 LA 3	Information Specialist 3	1	6	2	7
2 LG 5	Art Illustrator 5				6
2 NB 1	Personnel Officer 1		8	7	
2 NB 3	Personnel Officer 3		6	3	
2 RA 2	Accountant 2		12		
2 RA 3	Accountant 3			6	1
2 RA 6	Accountant 6		2	1	1
2 SA 1	Development Specialist 1		2	5	4
2 TT2 and 3	Appraiser 2 and 3		4		7
2 WM 3	Program Coordinator 3	1	7	7	8
2 WM 4	Program Coordinator 4		9		
2 WM 5	Program Coordinator 5	1	5	2	
2 WQ 2	Subdistrict Manager		15	15	10
Total		**3**	**76**	**48**	**44**

TABLE 44. Incidence of Kinds of Training Reported for Duties Performed by INDOT Employees in Code 3 Technical Jobs

Code	Job Title	FT	OJT	FT & OJT	NT
3 AA 2 and 3	Draftsman 2 and 3		3	2	
3 AB 1	Engineering Assistant 1	1	11	10	
3 AB 1	Engineering Assistant 1 (Design Division, Consultant Services Section)		2	5	
3 AB 1	Engineering Assistant 1 (Design Division, Traffic Section)		3	1	
3 AB 1	Engineering Assistant 1 (Design Division, Engineering Services)		3		7
3 KB 1	Field Investigator 3		13	4	3
Total		**1**	**35**	**22**	**10**

TABLE 45. Incidence of Kinds of Training Reported for Duties Performed by INDOT Employees in Code 3 Administrative Jobs

Code	Job Title	FT	OJT	FT & OJT	NT
3 LG 3	Personnel Technician		5	4	
3 MB 3 and 4	Secretary 3 and 4		7	7	7
3 JA 3, 4 and 5	Account Clerk 3, 4 and 5		7		
3 OS 5	Switchboard Operator 5				8
3 LD 3, 4 and 5	Clerical Assistants 3, 4 and 5		13	8	9
3 PA 3, 4 and 5	Stores Clerk 3, 4 and 5		6	6	3
Total		**0**	**38**	**25**	**27**

TABLE 46. Incidence of Kinds of Training Reported for Duties Performed by INDOT Employees in Code 4 Jobs

Code	Job Title	FT	OJT	FT & OJT	NT
4 IA 2	Maintenance Repair 2		14	7	3
4 MB 2 and 3	Highway Maintenance Worker 2 and 3	1	4	6	3
Total		**1**	**18**	**13**	**6**

TABLE 47. Incidence of Kinds of Training Reported for Duties Performed by INDOT Employees in Code 6 Jobs

Code	Job Title	FT	OJT	FT & OJT	NT
6 DC 4	Highway Engineer 4		10	21	10
6 DC 4	Highway Engineer 4 (Design Division, Traffic Design Section)				18
6 DC 4	Highway Engineer 4 (Design Division, Bridge Rehabilitation Unit)		9	4	
6 DC 5	Highway Engineer 5		7	7	3
Total		**0**	**26**	**32**	**31**

TABLE 48. Incidence of Kinds of Training Reported for Duties Performed by INDOT Employees in Code 8 Jobs

Code	Job Title	FT	OJT	FT & OJT	NT
8 AB 3	Engineering Assistant 3	1	16	13	14
8 AB 3	Engineering Assistant 3 (Design Division, Plan Development Section)				6
Total		**1**	**16**	**13**	**20**

TABLE 49. Incidence of Kinds of Training Reported for Duties Performed by INDOT Employees in Code 9 Jobs

Code	Job Title	FT	OJT	FT & OJT	NT
9 GA 4	Electronics Technician			9	
9 MB 4 and 5	Highway Maintenance S 4 and S5		11	9	6
Total		**0**	**11**	**18**	**6**

TABLE 50. Total for all Jobs in the Incidence of Kinds of Training Reported for Duties Performed by INDOT Employees

FT	OJT	FT & OJT	NT
12	280	212	178

TABLE 51. Summary Information on the Percentage of Duties Seen as Frequently Performed, Important, Requiring a High Degree of Skill, and Performed Well (any duty rated 4 or 5 on a 5 point scale on these dimensions is included).

Job Code	Frequency	Importance	Skill	Performance
1 tables 33-39	55	88	77	47
2 "	65	80	75	69
3 "	69	76	72	40
3	82	88	66	42
4 "	47	100	63	100
6 "	65	80	74	39
8 "	58	75	54	46
9 "	90	100	100	N.A.
Totals:	65	83	73	60

Analysis of Job Tasks for Engineers

Experts from academia and industry evaluated the job tasks of INDOT engineers. The experts were asked, based on the current status and future direction of transportation, if the job tasks of INDOT engineers covered the range of topics needed. Table 52 summarizes job tasks that were not found in the current job inventory.

TABLE 52. Areas of Current and Future Training Needs for Engineers that were not Covered in Job Duties

Quality Assurance/Quality Control
Statistics/Process Control
Superpave Design Procedure
Mechanistic/Empirical Pavement Design Procedures
New and Innovative Materials
Use of Modified Materials
Non-Destructive Pavement Evaluation and Analysis
Non-Destructive Evaluation of Bridges
New and Innovative Materials for Rapid Maintenance
Scrub Sealing/Microsurfacing
Maintenance Quality/Performance Evaluation
Innovative Contracting Practices to Reduce User Cost
Program to Train the Trainers

The experts judged that the job descriptions were missing three areas that will be vitally important for transportation in the near future: intelligent transportation systems (ITS), information technology, and transportation management systems. Table 53 lists the subcategories, which will be important in each of these three areas.

TABLE 53. Important Areas and Subcategories Missing from Current INDOT Job Descriptions

Important Areas		
Intelligent Transportation Systems (ITS)	**Information Technology**	**Transportation Management Systems**
• Only one duty (design ITS) in job descriptions (assigned to Division of Research) • Information on ITS (national standards, case studies, etc.) • Training (new technologies and techniques) • Development of local standards consistent with the national ITS architecture • Coordination issues at the district level • Evaluation of new technologies and systems	• Not addressed sufficiently in current duties • Information and training (GIS, linked databases) • Coordination of data sharing (other institutions, agencies) • Development and maintenance of linked or integrated databases • Internet-related tasks (data linking, security, access control, etc.)	• Not covered • Safety • Congestion

The training needs were evaluated and based on the job tasks and the responses from the supervisors the training needs were formulated. Table 54 summarizes the results.

TABLE 54. Training Needs for Engineers at INDOT

Job Category	Training Needs
Highway Engineer	This classification has varied training needs. At level I, the needs are an improved understanding of the impact design decisions have on other government agencies and improved supervision of engineers and staff. These can be addressed through an orientation session. At the other levels, formal training can address most needs and some can be addressed through an orientation session. Apparently, no formal training is occurring for level S4. Also pointed out was inconsistent training between districts. Orientation information can be effectively delivered electronically and is conducive to this approach because it eliminates the need for one-on-one training for new employees.
Construction Engineer	Apparently training is adequate or the positions are filled with experience personnel because the performance rating was good.
Engineering Specialists	Performance rating was very low. A closer look reveals training is needed for all functions of the classification.
Engineering Assistant	No formal training was provided, but this was based on only one response. More analysis is needed of the training in this position.
Surveyor	Individuals in this position appear to be adequately trained and are performing well.
Environmental Scientist	This position needs training in interpreting legal environmental requirements.
Development Specialist	Training is needed at this position, particularly in two areas: performing cost/benefit and input/output analysis; and evaluating alternate projects, examining design estimates, and performing economic and environmental analyses.
Program Coordinator	No formal training provided, but the job performance rating was high.
Subdistrict Manager	Job performance raing is good at 3.83. Two training areas were identified: developing and analyzing subdistrict schedules that access priorities between units and reflect the priorities of the district and the department; and submitting an annual work program that accurately identifies the road needs.
Overall summary of engineering positions	The needs identified reflect a mixture of training approaches, formal and informal. Some of the information can be presented effectively in orientation-type sessions. These sessions are conducive to computer-based applications. The formal training needs do not match with any National Highway Institute course offerings. Therefore, training for these subjects must be crafted individually.

Clerical Training Needs

Responses from clerical employees and their supervisors to the Job Inventory Survey (see Appendix VIII, Table 31) revealed that the type of training received for these duties varies greatly in different divisions and districts. For six of the seven duties, some respondents reported that no training is available to clerical employees. For five of the seven duties, some respondents reported the availability of only on-the-job training. Fortunately, supervisors rated their employees as

performing these duties quite well (4.5-5 on a 5 point scale), which may suggest no need for additional training for these particular duties. However, more information on the training received and the performance of individuals is needed to draw firm conclusions regarding the need training.

Interpersonal skills are essential for many clerical duties. However, except for "receiving visitors," no other duties requiring interpersonal skills were included on the job inventory. Interpersonal-type duties were not listed on INDOT's job descriptions for clerical employees and no respondents added them to the job inventory survey. Communication skills are important for understanding task instructions and for seeking clarifying information when assigned clerical tasks. In addition, clerical employees are often in the difficult position of being assigned tasks by multiple people with different and conflicting needs. Clerical employees need communication, assertiveness, power and politics management, and "customer" service skills to manage the conflicting obligations created by this type of job environment.

Although computer skills were not specifically listed in the job descriptions, clerical workers employees certainly need computer training on computers. Purdue evaluated the job classifications for the clerical workers to assess the software-package training needed. Table 55 summarizes this analysis for the different job categories. Since INDOT uses Microsoft products primarily, the table is organized according to the Microsoft product training needed.

TABLE 55. Training Needs for Clerical Workers at INDOT (an X indicates that the person with that job description would need training on using the product in that category).

Job title	**Word**	**Excel**	**Outlook**	**Powerpt**	**Access**	**Publisher**	**Other**	**Other**
Information Specialist 3	X	X	X	X	X	X	Web browser	
Art Illustrator 5	X	X		X		X	Web browser	PhotoShop
Personnel Officer 1	X	X	X		X			
Personnel Officer 3	X	X	X					
Program Coordinator 3	X	X	X		X		Computer program	
Personnel Technician	X	X			X			
Secretaries 3 and 4	X	X	X		X			
Account Clerk 3, 4, and 5	X	X			X			
Switchboard Operator 5	X	X	X		X			
Clerical Assistants 3, 4, and 5	X	X	X		X			
Stores Clerk 3, 4, and 5	X	X	X		X			

Benchmarking Survey

The benchmarking study was conducted to provide INDOT information regarding the training practices of other DOTs in the US, to provide points of comparison for INDOT's practices, and to offer ideas for changing or adding to its training practices. In addition to collecting data on training practices, we also collected information on DOT and training department characteristics. Such information will allow INDOT to determine the extent to which it has the appropriate structure, policies, and practices in place to implement training practices employed in other states. Finally, the relationships (presented below) between many of the variables for which we collected data will suggest to INDOT how its structure may affect training-related structures, practices, environments, and outcomes.

The benchmarking survey has been completed for 25 of the 50 states. Follow-up contacts are being established for the states not yet participating in the study. A copy of the questionnaire used for the training director interviews is included in Appendix IX. Table 56 summarizes the results by comparing INDOT responses to the averages from the other states. The full results are reported in Appendix X. In the following sections, some of the results from Table 56 are considered in more detail.

TABLE 56. Results from the benchmarking study that compares the responses from INDOT to average responses from the other states.

Variable	Item Number(s)	INDOT	Mean for Other States	Standard Deviation	No. of Other States
DOT Characteristics.					
Date DOT Founded	Q2	1919	1922	43.68	21
Number of full-time Employees	Q3	5200	5621.92	4695.6	24
Number of Districts	Q4	8	7.77	2.76	22
Number of Divisions	Q5+Q6	22	18.72	11.43	18
Standardization of DOT Practices (1-5 scale)	Ave. Q7-Q14	4	3.68	0.5	24
Is HR Director Part of the Top Management Team? (% yes)	Q34	Yes	42%	50%	24
Training-Related Environmental Characteristics.					
Right To Work State (% yes)	Q16	Yes	67%	48%	21
Extent to which State Laws Require Training (1-5 scale)	Q15	3	2.54	0.93	24
Union Support for Training (1-5 scale)	Q138	4	3.8	1.08	15
Extent to Which Union Contracts Have Specific Training Requirements. (1-5 scale)	Q139	3	2.15	1.21	13
Labor Market Issues.					
Extent to which new hires have needed skills (1-5 scale)	Q17	3	3.25	0.79	24
Existence of Skill Shortages in Labor Market.					
Professional Skill Shortage (% yes)	Q19A	Yes	57%	51%	23
Managerial Skill Shortage (% yes)	Q19B	Yes	13%	34%	23
Interpersonal Skill Shortage (% yes)	Q19C	Yes	35%	49%	23
Clerical Skill Shortage (% yes)	Q19D	No	9%	29%	23
Computer Skill Shortage (% yes)	Q19E	No	61%	50%	23
Literacy Skill Shortage (% yes)	Q19F	No	13%	34%	23
Physical Skill Shortage (% yes)	Q19G	No	9%	29%	23
How DOT Addresses Skill Shortages.					
Change Recruiting Strategies (% yes)	Q20A	Yes	84%	37%	19
"Borrow" or "Raid" from Other Areas of DOT (% yes)	Q20B	Yes	42%	51%	19
Provide More Training to New Hires (% yes)	Q20C	Yes	79%	42%	19
Increase Job Qualifications (% yes)	Q20D	Yes	32%	48%	19
Decrease Job Qualifications (% yes)	Q20E	No	26%	45%	19
Adopt New Technologies (% yes)	Q20F	Yes	58%	51%	19
Consider New Technologies (% yes)	Q20G	Yes	68%	48%	19

TABLE 56 (cont.). Results from the benchmarking study that compares the responses from INDOT to average responses from the other states.

Variable	Item Number(s)	INDOT	Mean for Other States	Standard Deviation	No. of Other States
Training Department or Function Characteristics.					
Is Training Function Part of the HR? (% yes)	Q21	Yes	71%	46%	24
Is Training Director Part of the Top Management Team? (% yes)	Q35	No	0%	0%	24
Top Mgt. Support For Training (1-5 scale)	Ave. Q105-Q112	2.75	3.36	0.86	24
Interests of Training Dept. Represented In Top Mgt. Strategic Decisions.(1-5 scale)	Ave. Q67-Q72	3.5	3.14	0.97	24
Age Of Training Department (years)	2000-Q23	16	19.87	10.71	23
Number of Employees in Training Department	Q24	4	10.71	9.18	24
Ave. Yrs. Training Experience of Training Dept. Employees	Q25	4	9.13	4.49	24
% Training Dept. Employees with Training Education	Q26	25%	19.00%	17.00%	24
% Training Dept. Employees with Engineering Education	Q27	0%	3.38%	7.92%	24
Educational Background of Training Director.					
Training or Education (% yes)	Q28A	Yes	50%	51%	22
Management, Business, or Human Resources (% yes)	Q28B	No	59%	50%	22
Engineering (% yes)	Q28C	No	9%	29%	22
Liberal Arts, Sciences (% yes)	Q28D	No	36%	49%	22
Training Resources.					
Training Department Budget ($)	Q36	600000	763050	674959.45	20
$ Spent on Training by Divisions & Districts	Q37	Unknown	458916.67	578532.23	12
Hours of Formal Training Per Employee Per Year	Q38	75	29.38	18.84	17
$ Spent of Formal Training Per Employee Per Year	Q39	115	306.89	388.78	13
Hours of On-The-Job Training Per Employee Per Year	Q73	75	38.46	27.74	13
$ Spent of On-The-Job Training Per Employee Per Year	Q74	Unknown	615.7	749.97	9
# New Training Programs Initiated by Training Dept. in Last Year	Q40	3	8.33	10.69	24
# New Training Programs Initiated by Districts & Divisions in Last Year	Q41	Unknown	11.41	13.92	17
Change in Rate of Training Program Initiation (1-3 scale, 3=increased)	Q42	3	2.71	0.55	24

TABLE 56 (cont.). Results from the benchmarking study that compares the responses from INDOT to average responses from the other states.

Variable	Item Number(s)	INDOT	Mean for Other States	Standard Deviation	No. of Other States
Training and Training-Related Policies and Practices.					
% of Training that is Formal (v. On-The-Job Training)	Q29	65%	60.15%	25.78%	20
Extent to Which On-The-Job Training is Formalized (1-5 scale)	Ave. Q75-Q83	2.67	2.55	0.57	23
% Training Programs Purchased (v. Developed In-house)	Q31	50%	55.65%	31.49%	23
Extent to Which Courses Taken Outside DOT (e.g., NHI) (1-5 scale)	Q32	4	3.42	1.06	24
Extent NICET Certification Used (1-5 scale)	Q33	1=not used	2.53	1.59	17
% Training Taught by Financed, Approved by Training Department	Ave. Q58-Q61	85%	42.50%	27.41%	24
Responsibility For Training-Related Activities (1=Divisions/Districts, 5= Training Dept.)	Ave. Q62-Q66	4.4	3.19	0.75	24
Standardization of Formal Training (1-5 scale)	Q13	4	3.87	0.95	24
Standardization of On-The-Job Training (1-5 scale)	Q14	3	2.75	0.94	24
Training Methods.					
Extent to Which Various Training Methods Used.					
Lecture (1-5 scale)	Q43	3	3.04	1.27	24
Interactive Methods (1-5 scale)	Q45	5	3.83	0.92	24
Computer-Based Training (CBI) (1-5 scale)	Q47	2	2.17	0.87	24
% of CBI Incorporating Audio/Video	Q48	50	46.11	39.98	9
Existence of Policy Allowing Work Time for CBI (% yes)	Q56	No	65%	49%	23
% Employees with Access To Internet	Q57	40%	59.73%	30.32%	22
Distance Learning (1-5 scale)	Q50	2	1.96	0.91	24
Networked Info Systems (1-5 scale)	Q52	2	1.96	0.95	24
Simulations (1-5 scale)	Q54	4	2.09	0.95	23
Expected Change in Use of Training Methods in Next 5 Years.					
Lecture (1-5 scale)	Q44	3	2.17	1.05	24
Interactive Methods (1-5 scale)	Q46	4	4.08	1.1	24
Computer-Based Training (CBI) (1-5 scale)	Q49	4	4.37	0.58	24
Distance Learning (1-5 scale)	Q51	3	4.08	0.65	24
Networked Info System (1-5 scale)	Q53	3	3.83	0.78	23
Simulations (1-5 scale)	Q55	4	3.48	0.79	23

TABLE 56 (cont.). Results from the benchmarking study that compares the responses from INDOT to average responses from the other states.

Variable	Item Number(s)	INDOT	Mean for Other States	Standard Deviation	No. of Other States
Other Training Practices.					
Extent to Which Formal Training Needs Analyses are Performed (1-5 scale)	Ave. Q84-Q90	2.63	2.98	0.9	24
Training Outcome Evaluation.					
Extent to Which Different Types of Evaluations are Performed.					
Trainee Reactions (1-5 scale)	Q92	5	4.25	0.85	24
Knowledge Tests (1-5 scale)	Q93	2	2.58	0.58	24
Work Samples at the End of Training Sessions (1-5 scale)	Q94	2	2.21	0.83	24
Supervisors Evaluations Back on the Job (1-5 scale)	Q95	1=not used	1.92	0.97	24
Self-Evaluations Back on the Job (1-5 scale)	Q96	1=not used	2.3	1.15	23
Trainer Evaluations Back on the Job (1-5 scale)	Q97	1=not used	2.12	1.23	24
How Training Outcome Evaluations Are Used.					
To Make Changes in Training Programs (1-5 scale)	Q98	5	3.71	1.12	24
To Make Decisions About Need to Retrain (1-5 scale)	Q99	5	2.83	1.05	24
To Evaluate the Performance of Trainers (1-5 scale)	Q100	5	3.42	1.21	24
To Determine Rewards for Trainers (1-5 scale)	Q101	1=not used	1.78	1.13	23
To Make Decisions About Training Budget Changes (1-5 scale)	Q102	2	2.13	0.95	24
To Gain Support for Future Training Efforts (1-5 scale)	Q103	4	3.21	1.1	24
Types of Evaluation Designs Used.					
Posttest Only (% yes)	Q104A	Yes	67%	48%	24
Posttest Only with Control Group (% yes)	Q104B	No	4%	20%	24
Pretest-Posttest (% yes)	Q104C	Yes	46%	51%	24
Pretest-Posttest with Control Group (% yes)	Q104D	No	4%	20%	24
Time Series (% yes)	Q104E	No	42%	50%	24
No Evaluation Design (% yes)	Q104F	No	54%	51%	24

TABLE 56 (cont.). Results from the benchmarking study that compares the responses from INDOT to average responses from the other states.

Quality of Transfer Environment.					
Rewards Given for Obtaining Training & Using Skills Learned (1-5 scale)	Ave. Q135-Q137	2	2.49	0.76	24
Obtaining Training & Using Skills Learned Discouraged (1-5 scale)	Ave. Q114, Q118, Q119, Q121, Q123, Q130	2.5	2.26	0.6	24
Supervisor Support for Obtaining Training & Using Skills Learned (1-5 scale)	Ave. Q113, Q115-Q117, Q120, Q122, Q124, Q125	2.6	3.21	0.57	24
Coworker Support for Obtaining Training & Using Skills Learned (1-5 scale)	Ave. Q128, Q129, Q131	3.67	3.4	0.54	24
Use of Skills Facilitated by Job (1-5 scale)	Ave. Q132-134	3	3.32	0.72	24
Training-Related Organizational Performance Outcomes.					
Adaptability of Workforce in Face of Problems, Changes, & Emergencies (1-5 scale)	Ave. Q140-Q144	3.2	3.63	0.48	24
Flexibility of Workforce When Transferred to Jobs with Different Duties (1-5 scale)	Ave. Q146, Q148, Q150	3	3.53	0.52	19
% Employees Transferred in Last Year	Ave. Q145, Q147, Q149	Unknown	12.02	17.86	15
Training Department Budget Spending Last Year (1=Under, 3=On, 5= Over Budget)	Q151	3	3.05	0.58	22
% of Training Department Projects & Plans Completed On-Time & within Budget	Ave. Q152-Q155	87.50%	86.84%	13.60%	24

Organizational Structure

The following questions compared the organizational structure of INDOT to the other state DOTs.

Figure 3 shows a comparison of the number of employees. Overall, INDOT has slightly fewer employees than average.

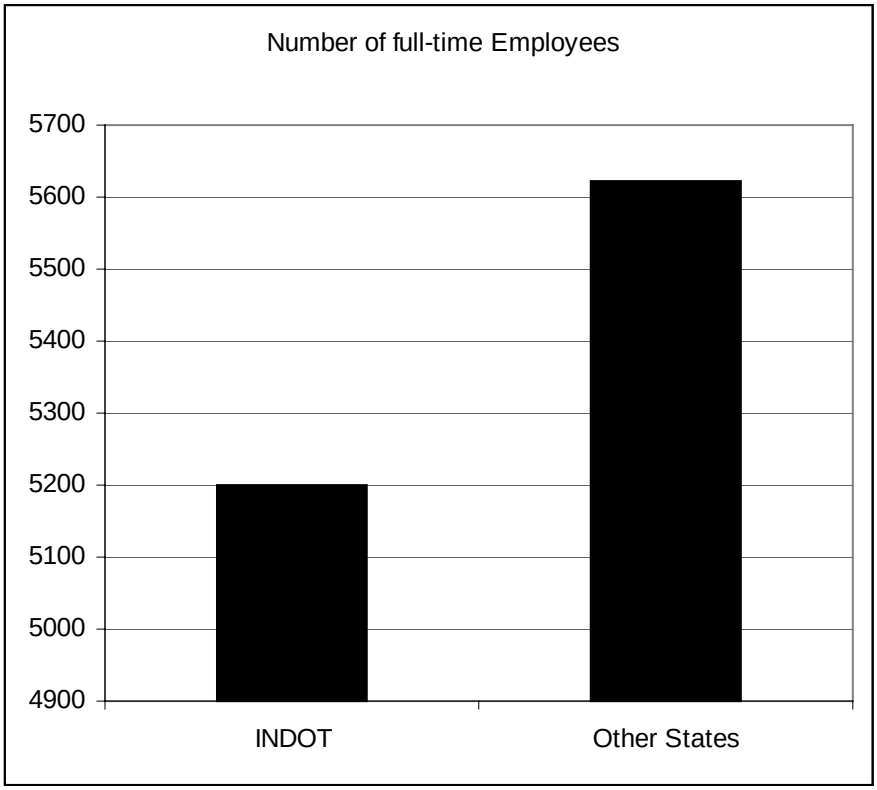

Figure 3. *Number of full-time employees at INDOT compared to the other states.*

INDOT has more divisions than average, which is indicative of greater functional differentiation. INDOT has about the same number of districts (see Figure 4).

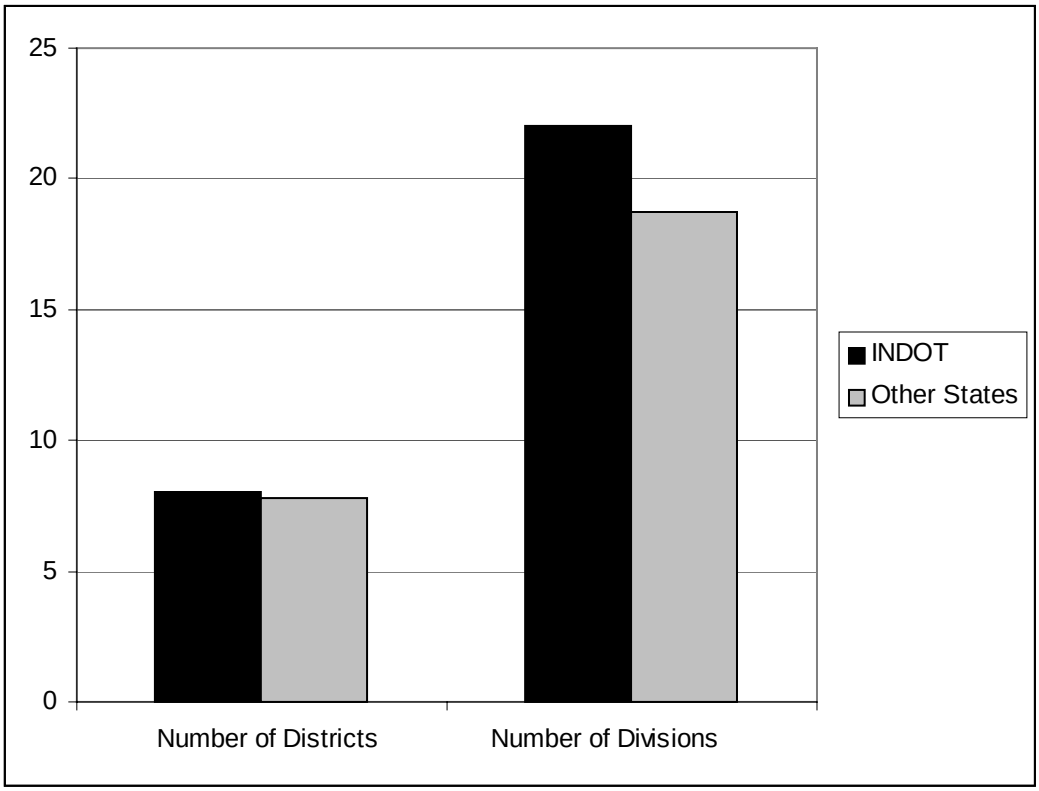

Figure 4. *Number of districts and divisions of INDOT compared to the other states.*

Respondents were asked whether or not Human Resource (HR) directors were part of the top management team. The results are shown in Figure 5. The figure shows the percentage of states in which the HR Director is part of top management. Since the HR director is a part of top management for INDOT, the bar for INDOT is set to 100%.

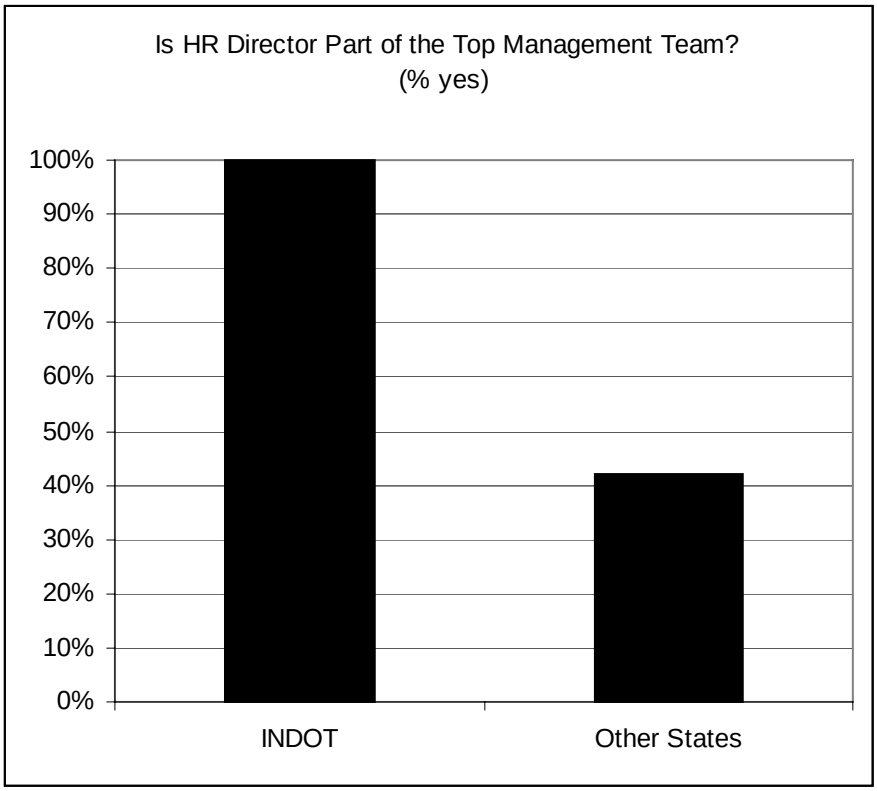

Figure 5. *Management structure for the HR director.*

Skills of New Hires

Several questions addressed the availability of certain kinds of skills in the potential labor market. Respondents answered yes or no to these questions. In the following figures, if the INDOT respondent answered yes, the bar is placed at 100%. If the answer was no, the bar was set at 0%. The number of responses that were yes determines the score from the other states.

Figure 6 shows a comparison between INDOT and other states on skill shortages. In the graph, a high percentage indicates a skill shortage. The major differences between INDOT and the other states occurred in the following skills. INDOT indicated that it experienced skill shortages in managerial skills. However, only 13% of the states reported this shortage. On the positive side, INDOT reported no problem in finding people with computer skills; 61% of the other states indicated problems finding people with computer skills.

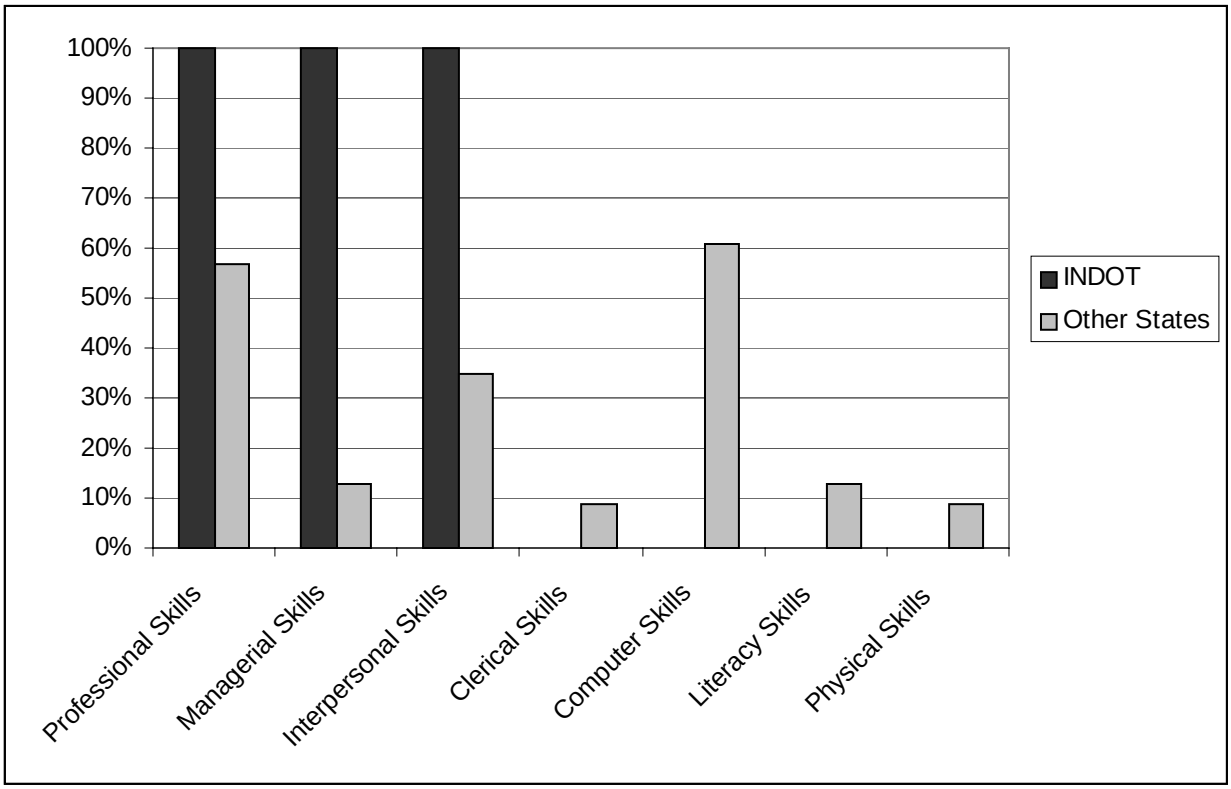

Figure 6. *Shortages of skills (percent of states reporting shortages)*

Characteristics of the Training Department

Several questions addressed the characteristics of the Training Section. Characteristics include the organizational structure, the employees, and the resources.

At INDOT the training section is part of Human Resources. For the other states, 71% reported a similar structure. In all cases, both for INDOT and the other states, the training director is not a part of the top management team. Figure 7 shows the perceived support of top management for training functions. As can be seen, top management support for training at INDOT is perceived to be lower than that seen in other states.

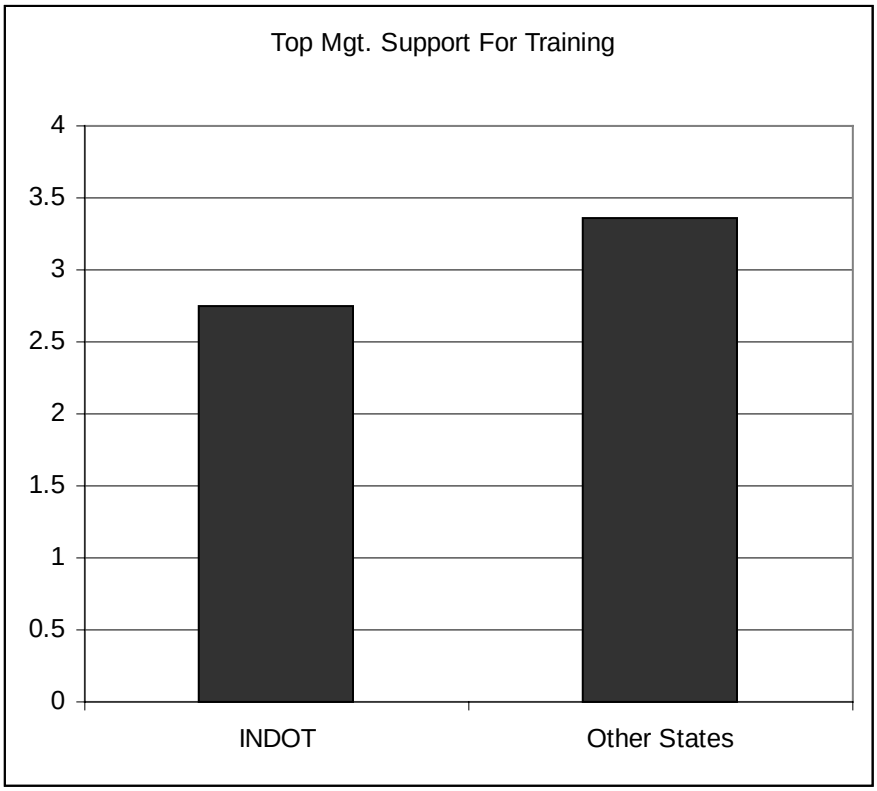

Figure 7. *Management support of training (1-5 scale with 5 representing high support and 1 representing low support.)*

INDOT's Training Section is more than 2.5 times smaller than average (see Figure 8), and its Training Department staff has less than 50% of the training experience of other states (see Figure 9).

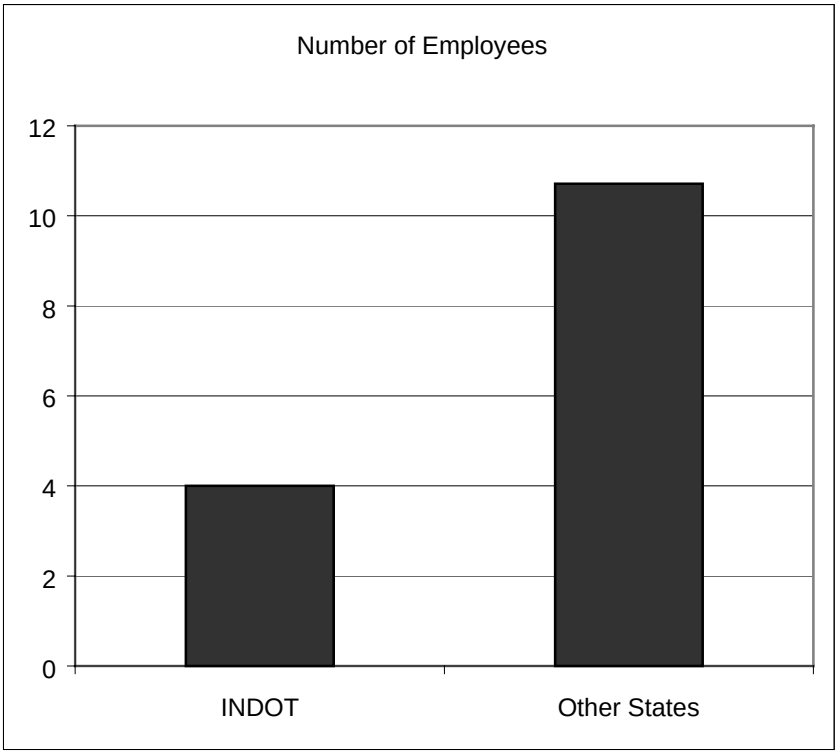

Figure 8. *Number of employees in the training department.*

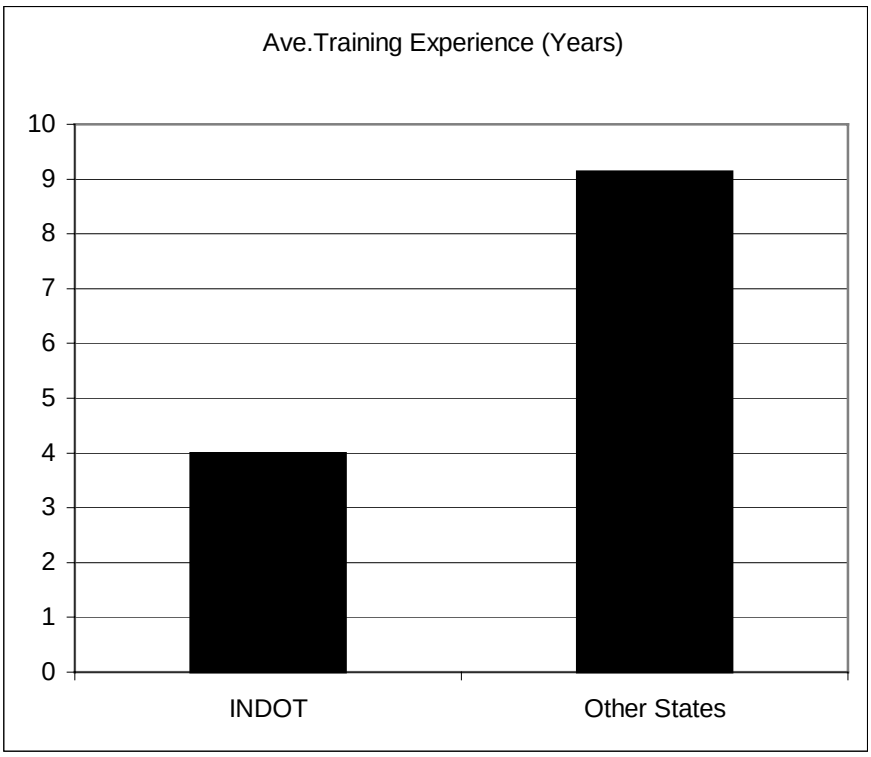

Figure 9. *Average experience of employees in the training department.*

Several questions addressed budget and resources. The budget of INDOT's training section is much lower than average (see Figure 10). For this study, INDOT was unsure of the amount of money spent on training by the divisions and districts. The other states indicated that their divisions and districts spent an average of $458,917 on training. The results of our study showed that divisions and districts budgeted $56,644 for the direct costs of training in 1998 and spent $1,941,427 when indirect costs were taken into account. Figure 11 compares the money from the questionnaire responses to the direct costs of INDOT divisions and districts.

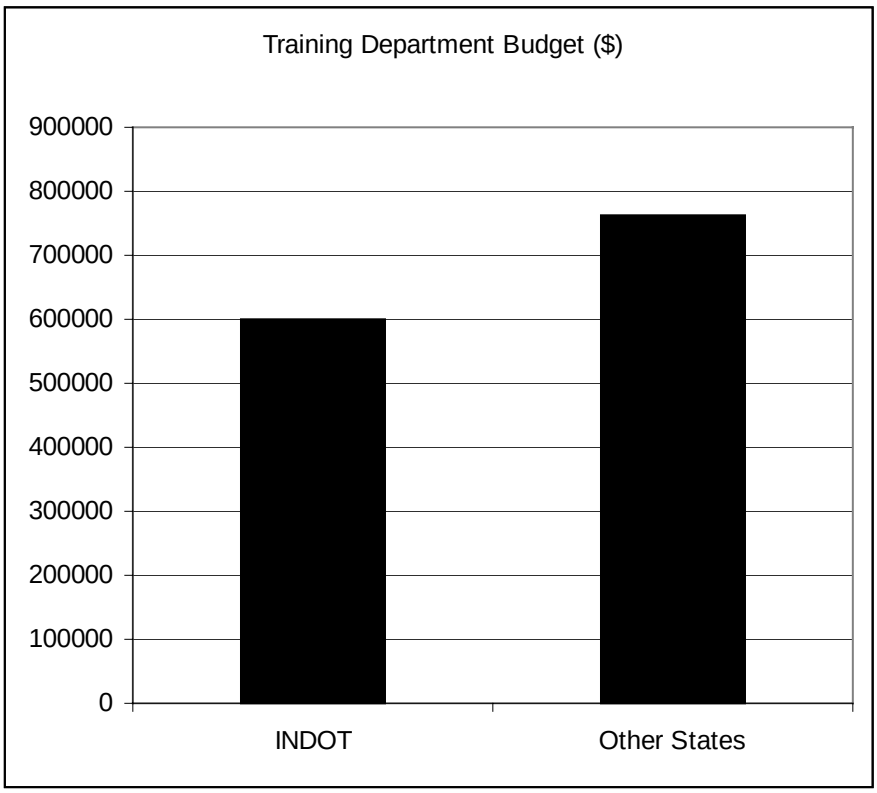

Figure 10. *Training Department budgets*

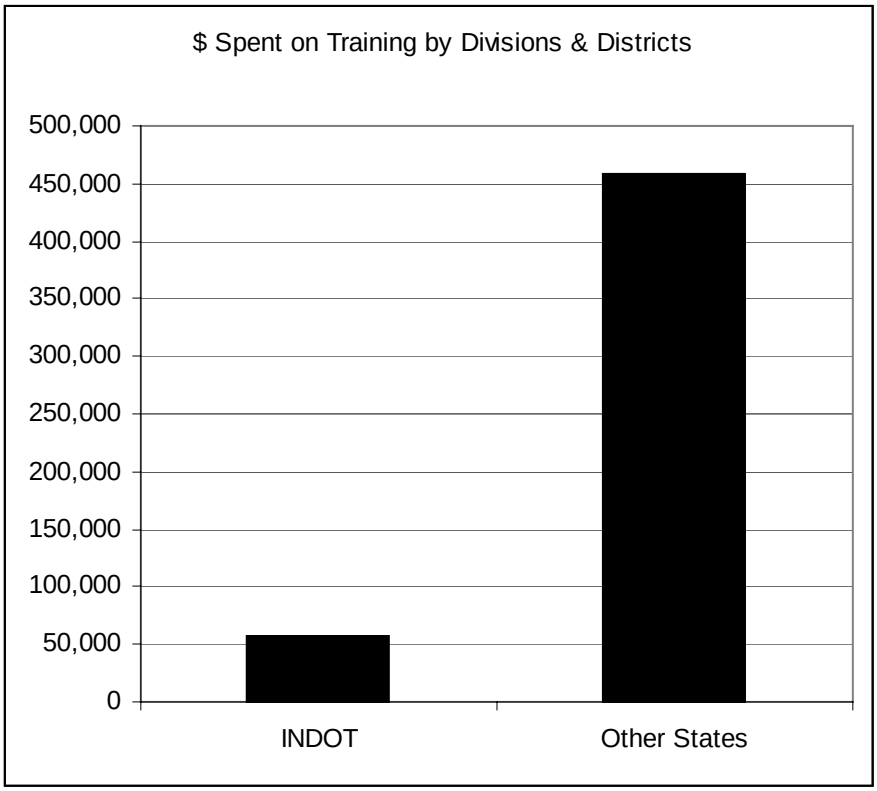

Figure 11. *Money spent on training by divisions and districts (INDOT direct costs).*

Training Activities

Questions in this section addressed the amount of training that was performed and the initiation of new training programs. Figure 12 addresses the number of hours of formal training provided to employees per year and Figure 13 shows the money spent on formal training. Figure 14 shows the number of hours of on-the-job training provided. INDOT could not provide an estimate of the amount of money that was spent on on-the-job training. The other states spent an average of $616 per employee per year for on-the-job training.

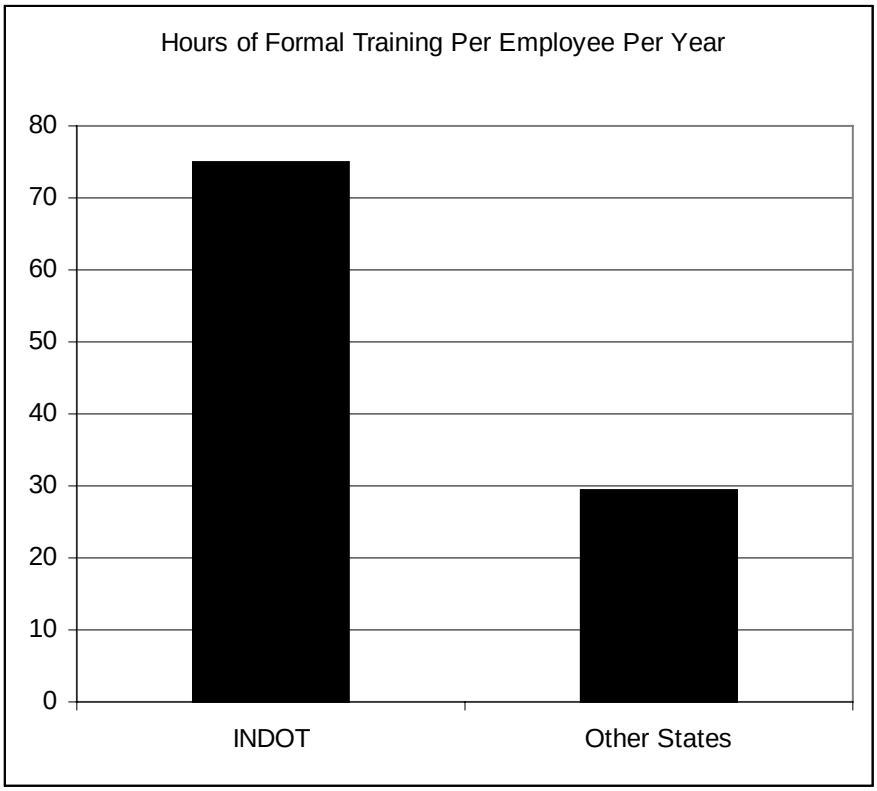

Figure 12. *Hours of formal training per employee per year.*

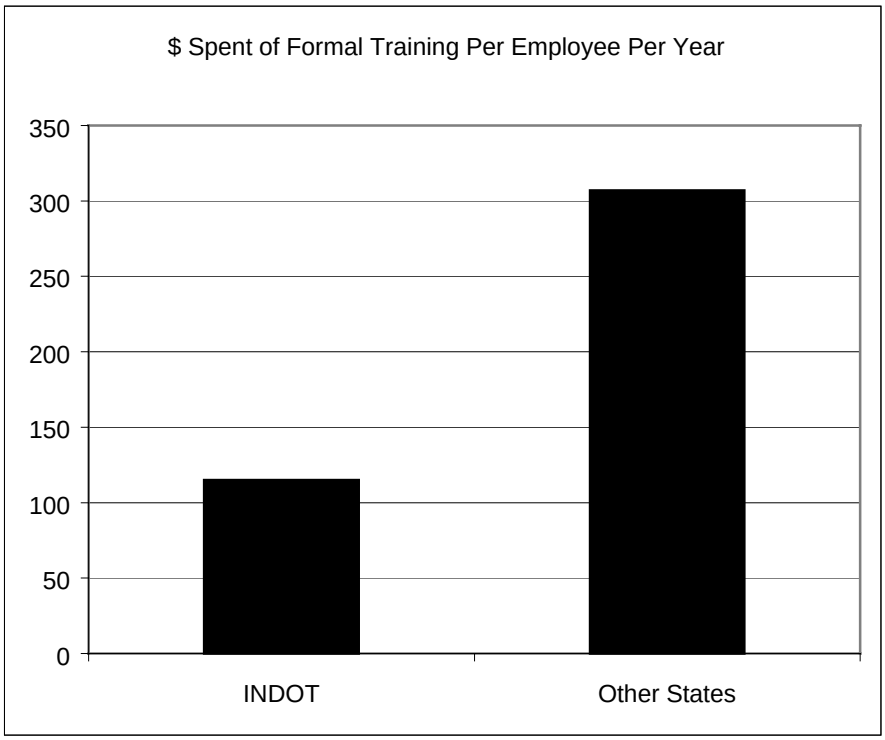

Figure 13. *Money spent on formal training per employee per year.*

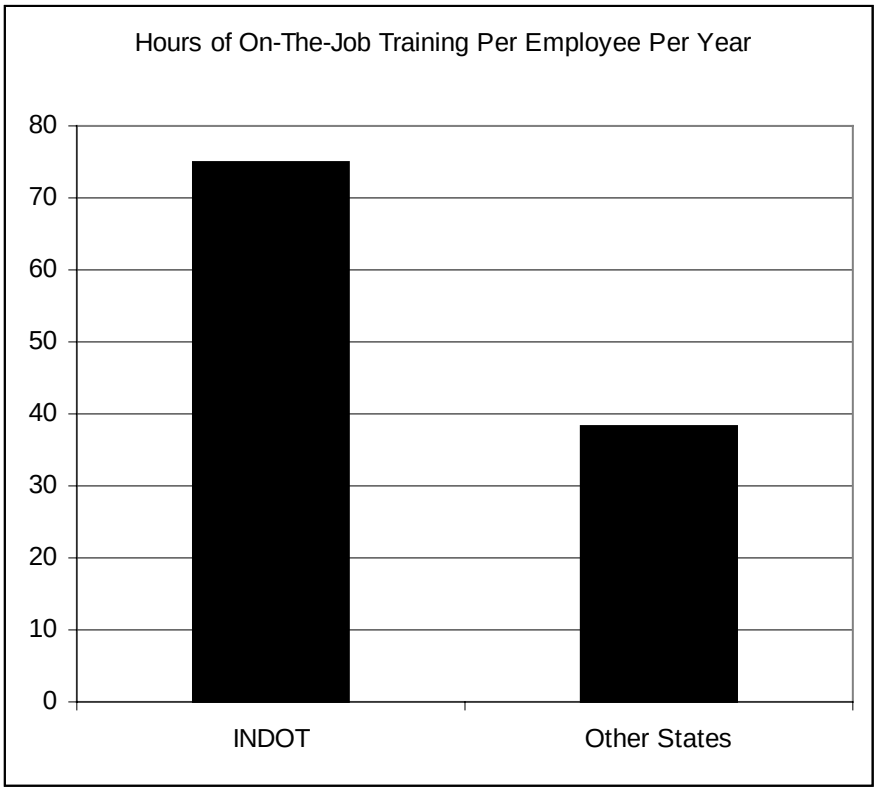

Figure 14. *Hours of on-the-job training per employee per year.*

Generally, INDOT reported that it spent less money per employee for training yet trained employees for more hours when compared to the other states. The results from our "Training Costs Survey" showed that INDOT spent $496/employee/year when both direct and indirect costs were considered in the cost. Removing the indirect costs, INDOT spends only $168/employee/year. Overall, the other states indicated that they spent $923/employee/year total when combining formal and on-the-job training. This is still far less than the $1526 spent by the private sector.

INDOT's training function is more centralized than that of the other states. More than double the training is taught, financed, and approved by the Training Section than the average of the other states. In addition, INDOT's Training Department, as opposed to the districts and divisions, is responsible for more training-related activities (i.e., administration, instructional design, needs analysis) than the other states. This is particularly interesting in light of INDOT's smaller Training Section budget.

Types of Training

INDOT's use of lecture, computer-based training, and networked information systems for training is similar to the average use of these training methods by the other 24 states. INDOT uses more interactive training methods and more simulations for training than do the other states (see Figure 15). In addition, other states anticipate using more distance learning in the next five years, while INDOT anticipates no change in the use of distance learning (see Figure 16).

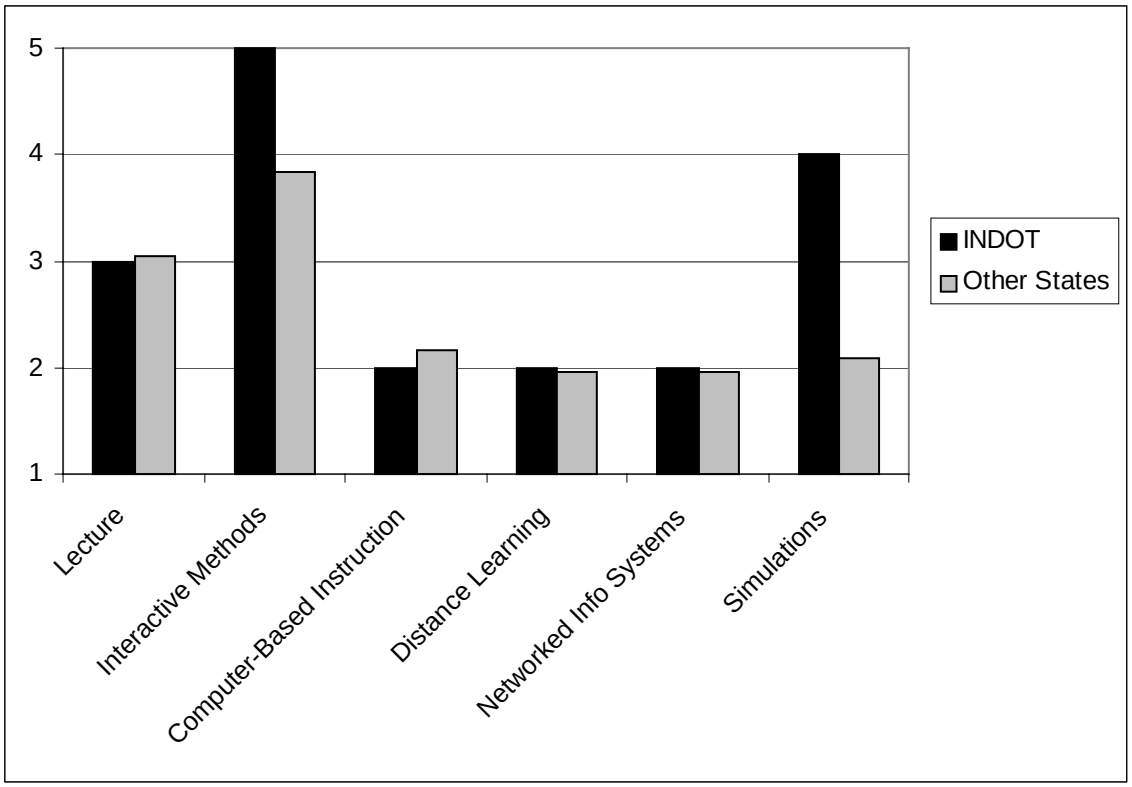

Figure 15. *Comparison of current training methods*

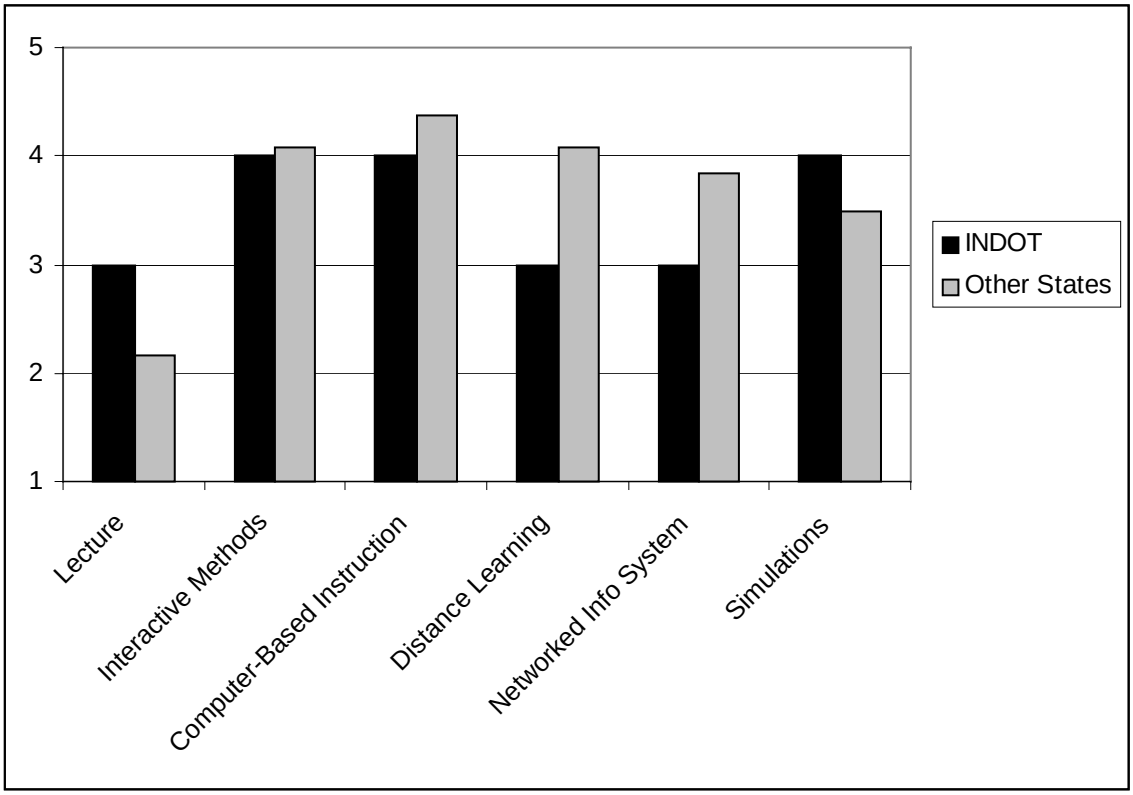

Figure 16. *Expected change in training methods in next 5 years*

As stated above, INDOT's use of computer-based instruction (CBI) is similar to that of other states. However, while 65% of the 24 states have a policy regarding the use of work time for CBI, INDOT does not. In addition, 40% of INDOT employees have access to the Internet, while an average of 60% of employees in other states have access.

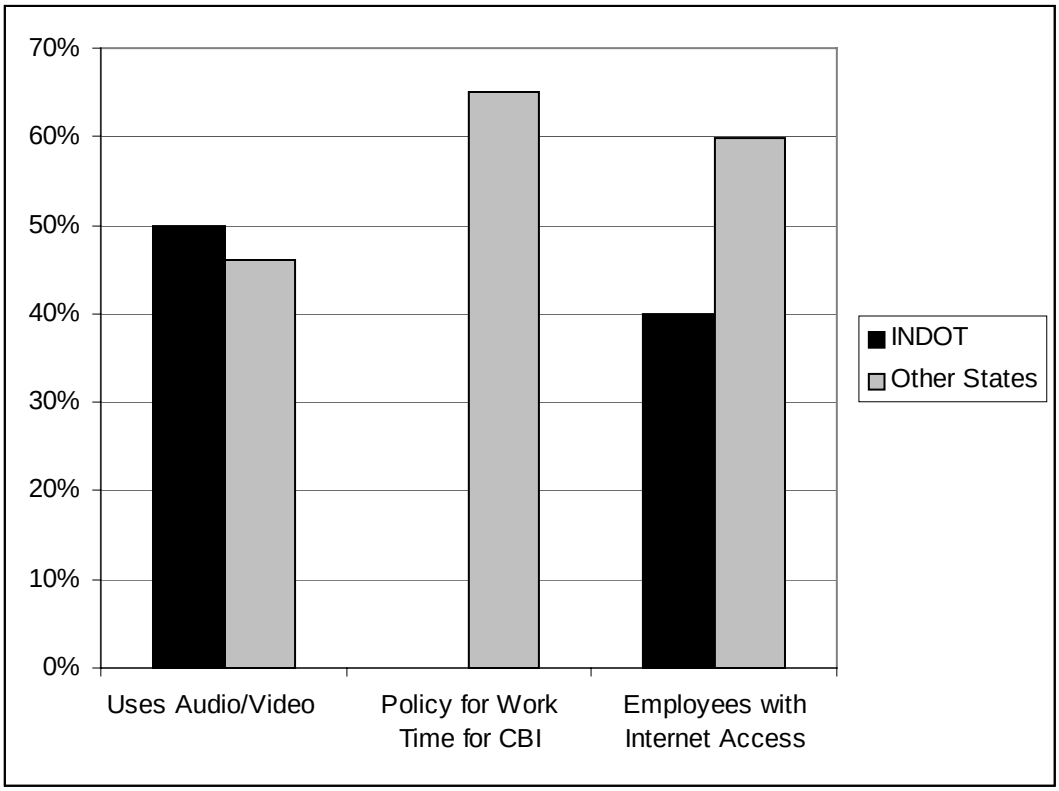

Figure 17. *Uses of computer-based instruction*

Training Outcome Evaluations

While INDOT's assessment of training outcomes during and immediately following training are similar to that of other states, INDOT measures transfer of training (i.e., performance evaluations back on the job) to a lesser extent (see Figure 18). Recent research has demonstrated no relationships and negative relationships between immediate training outcomes and longer-term outcomes. This suggests that trainee reactions, knowledge tests, and work samples collected during or immediately following training are not indicative of the amount learned or the extent to which skills transfer back to the job.

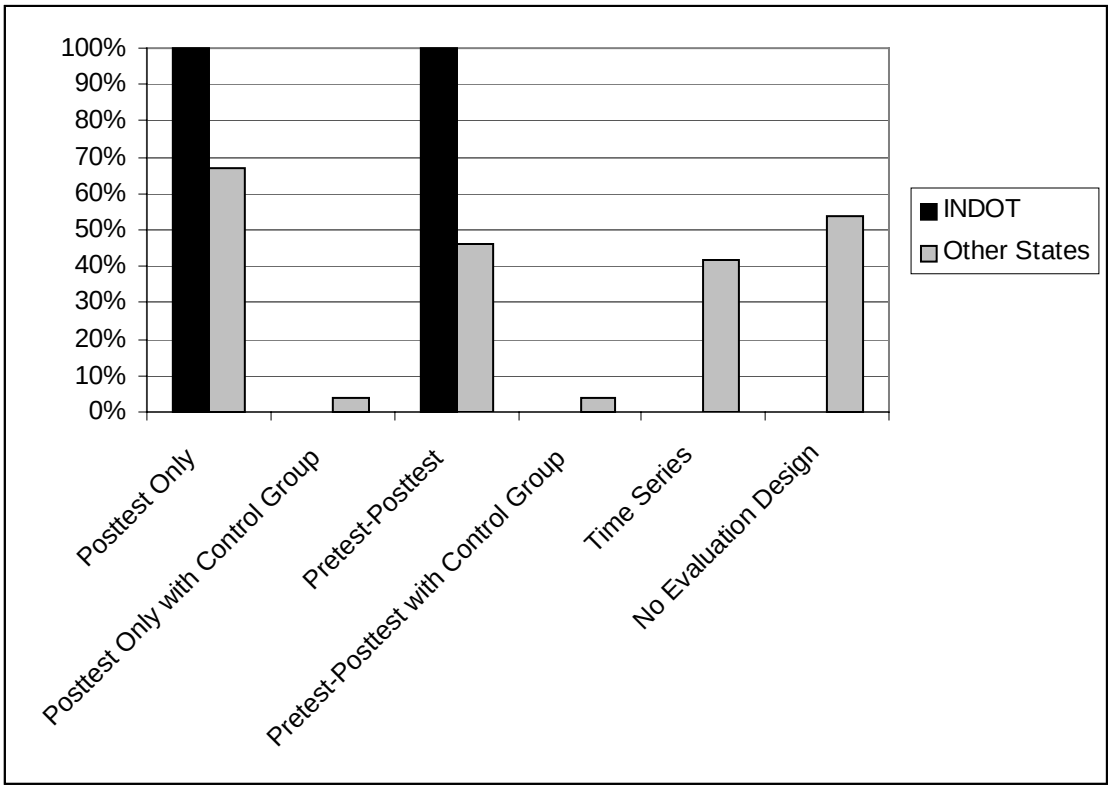

Figure 18. *Training outcome evaluation techniques (% of states using the technique, for INDOT the answer was either yes, 100%, or no, 0%)*

INDOT uses training outcome evaluations to make changes in training programs, decisions about whom to retrain, to evaluate the performance of trainers, and to gain support for future training efforts more than the other 24 states do on average. This is commendable, but further highlights the importance of measuring transfer of training.

Like most of the other states, INDOT does not use the pretest-posttest with control group design to assess training program effectiveness. INDOT also does not use the time-series design, while 42% of the other states use this design to assess training program effectiveness. These two designs are far superior to the other options: posttest only, posttest only with control group, pretest-posttest (with no control group). INDOT and 67% of the other states use the posttest only design to assess training program effectiveness. Unfortunately, this design can provide absolutely no useful information regarding training program effectiveness. (See the Training Director Interview, question 104 for definitions of the various training outcome assessment designs.)

The quality of INDOT's transfer environment—support for obtaining and using skills learned in training—is similar to that of other states on all dimensions (see Figure 19). However, neither INDOT nor the other states scored high on any dimension. INDOT and the other states scored highest on "co-worker support for obtaining training and using skills learned."

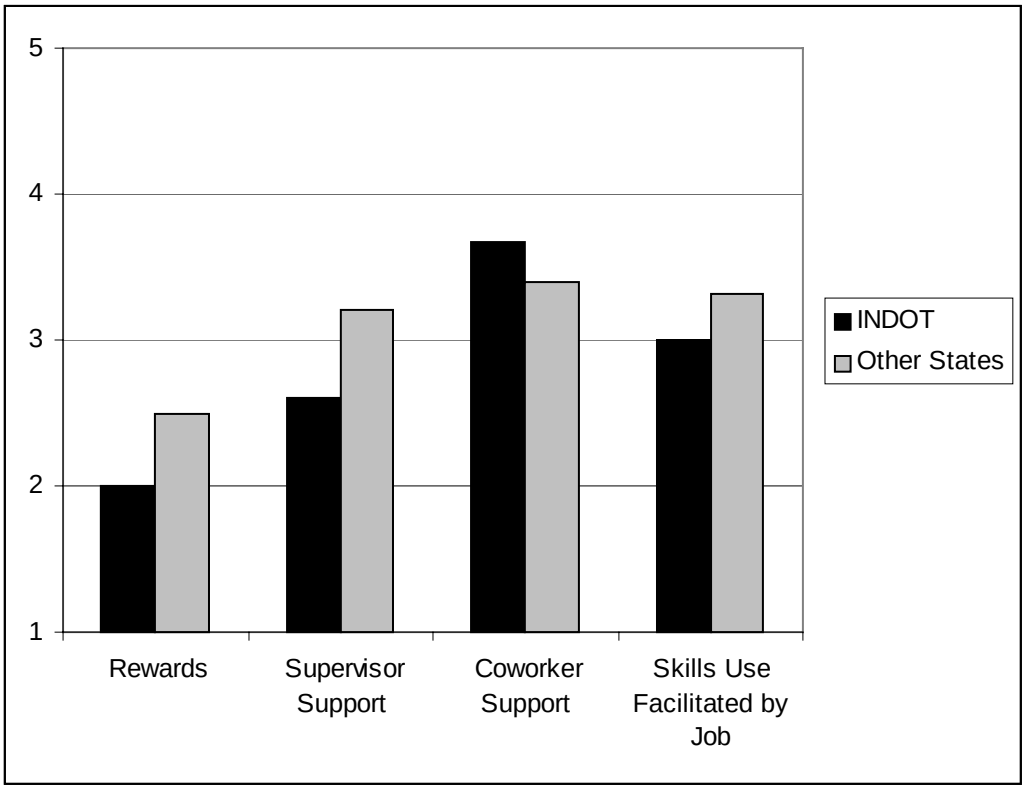

Figure 19. *Training transfer environment (% of states using the technique, for INDOT the answer was either yes, 100%, or no, 0%)*

INDOT's workforce was rated as slightly less adaptive and flexible than the average of the other states (see Figure 20). INDOT's workforce was rated as doing a fair job on these performance dimensions. However, like the other states, INDOT's Training Section was on budget last year and most of its projects and plans were completed on time and within budget.

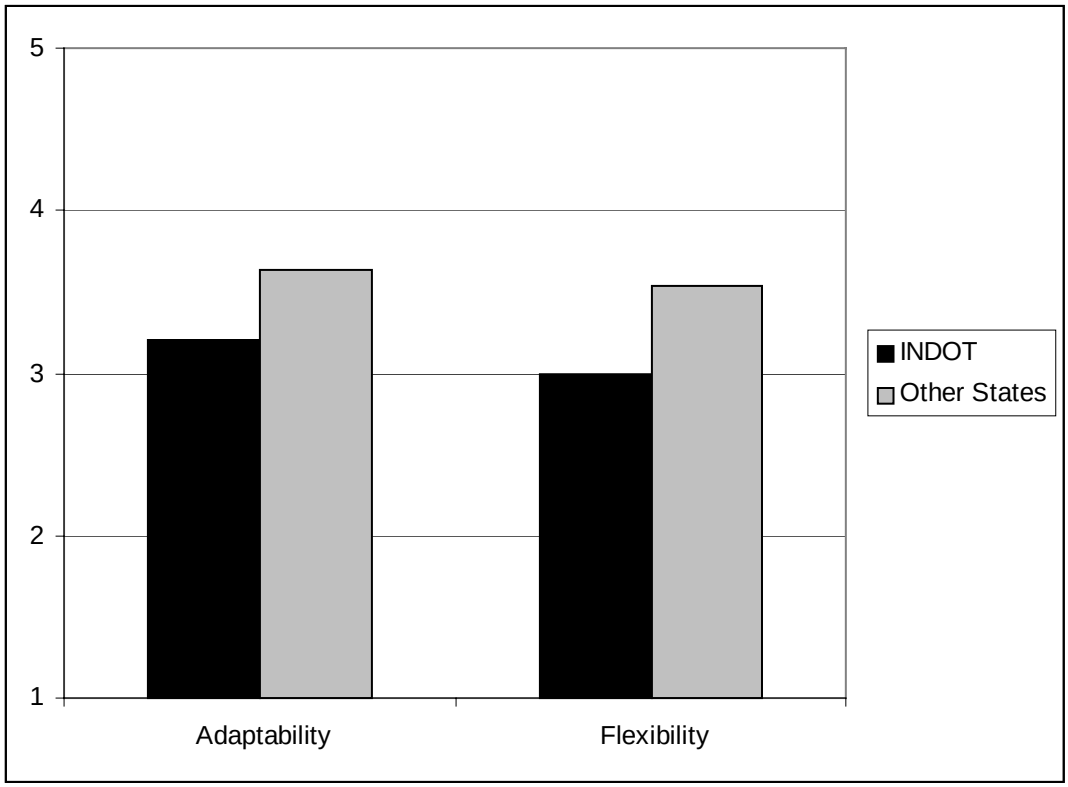

Figure 20. *Adaptability and flexibility of the workforce*

Recommendations

The training recommendations are divided into five areas:

- Computer skills
- Basic and Interpersonal Skills training
- Technical training (common to all Departments of Transportation)
- Technical training (specific to INDOT)
- Continuing education

In this section of the report, recommendations are made in these five areas. Each recommendation grounded in data, which were collected through the surveys and interviews.

Computer Skills

Many individuals within INDOT feel that computer training will become vitally more important to INDOT in the next five years. Many of INDOT's managers and supervisors do not feel that employees' level of competency with computers is adequate to meet changing computer application needs. Currently, the Department of Administration provides introductory-level courses in most Microsoft Office applications (Excel, Word, PowerPoint and Access).

Facts

Many of INDOT's managers and supervisors expressed frustration with the training from the Department of Administration citing three main problems:

- *Availability:* Computer courses are often already full when they try to schedule their employees so that, often, individuals have to wait several months to take a course.
- *Customizability:* Advanced classes are very infrequent
- *Offerings:* Many felt that learning only the basic Microsoft Office applications is only addressing a portion of INDOT's needs.

To solve these problems, INDOT managers and supervisors recommended the following:

- *Multimedia training should be considered.* All divisions and districts except one said that multimedia training would be very desirable. Districts felt that it would be a cheaper and more effective way of disseminating training to their field offices while cutting back on travel and lost work costs. Since lost work costs accounted for a very high proportion of the training costs, significant savings could be achieved.
- *More "higher-level" computer training is needed.* Current lessons are not structured well for individuals who have adequate computer skills, but wish to learn more complicated, higher-level computer skills.
- *More offerings are needed.* More reliable, customizable, and timely computer courses will be needed with more choices and competency levels.

Recommendations

Move computer training to a vendor that can provide multimedia lessons to the employees' desktop on demand via CD-ROM, Web, INDOT intranet, or INDOT LAN.

Characteristics of Multimedia Training

In the last couple of years, companies offering on-line or CD-ROM training for computer skills have grown tremendously. These companies are targeting high-need areas, such as computer skills required to run Microsoft Office products. Consequently, many companies offer programs in this area, and the pricing is quite competitive.

Three companies are leaders in this area within Indiana and the rest of the country: learn2.com, netg.com, and SmartForce. Indiana University uses the services of netg.com and Purdue University uses the services of SmartForce.

The products from each of these companies have similar characteristics. Each of them offers multimedia lessons that can be delivered to the employees' desktops through a variety of means. The multimedia aspect of the lessons emphasizes particular instruction strategies. The learn-by-doing strategy emphasizes that people learn by actually doing the operations that will be performed later with the software. As an example, if the person is being taught how to change a font in Microsoft Word, then these programs would make the person actually change a font in Word. Animation is often used to show people how to perform the steps or to draw their attention to certain aspect of the display. Voice instruction and video are sometimes used for the lessons. Generally, the multimedia aspects of the instruction and the active engagement of the learner make instruction more interesting.

A huge advantage for multimedia over traditional classroom teaching is that the multimedia lessons can be tailored to the individual learner. Whereas the slowest learners often drive the pace of classroom training, multimedia training is self-paced meaning that learners can proceed through the lessons at their own speed. The lessons are usually bookmarkable, meaning that learners can stop at any time and anyplace in the lesson, and then start back up at the same location. Maps, indicating current location and future directions, are also usually provided to ease the problems with interface navigation.

Another advantage is that the level of the lesson can be tailored to the learner's needs or level of expertise. Most lessons are preceded by a pre-assessment test of knowledge. Based on the results of the assessment, learners are given the information that they do not know at the appropriate expertise level. After the lessons, learners are also tested. If competency has not been achieved, then the learner may need to retake certain parts of the course.

Programs typically include some kind of management program so that a trainer can assess the time spent on task, the performance, and the modules studied of the employees in the organization. These updates are typically provided through proprietary programs or through commercial packages such as MS Access.

Some packages also have a curriculum development capability. Curricula can be developed for certain employees or for certain job categories. Different curricula may include different lessons or levels of lessons.

The delivery method emphasis is to get the programs to the learner's desktop, thus reducing travel costs and classroom requirements. Delivery is done in a variety of ways:

- On-line through the Web
- CD-ROM
- Organization's Intranet
- Local Area Network (LAN)

The delivery method utilized depends on a number of factors. On-line delivery is usually less expensive than other available methods. Typically, learners would be provided a login and password in order to gain access from any computer connected to the Internet. Problems with this method include: slow or unpredictable connection speeds; problems receiving material through organization's firewalls; and limited access to the Internet.

If a learner is not connected to the Internet, CD-ROM is one method to gain access to the material. With a CD-ROM, lessons will typically run faster than that available through most Internet connections. The main problem with CD-ROM delivery is the distribution of disks to the employees. Whereas Internet connections can be immediate, distributing the disks is dependent on the mail system or internal mail delivery. Employees would need to know who to contact for the disks.

In some cases, the lessons can be delivered electronically to the organization's Intranet or LAN. This method is desirable if firewalls are a problem or if the Internet connections outside of the organization are too slow. The organization must, however, have sufficient computer disk storage to handle the files. Some computer support is needed from the organization.

Most vendors provide some kind of technical support, although this technical support can vary greatly. NetG offers 24-7 technical support, but learn2 only offers technical support during business hours. NetG provides no support on lessons to the students, but learn2 will guarantee an e-mail response to students on specific questions within 24 hours (the typical response time is three hours).

Cost

Currently, INDOT pays the Department of Administration (DOA) $100 for each student enrolled in live classroom instruction. The cost for on-line, multimedia programs is about 1/100 of the cost of a DOA course, resulting in large savings on direct costs. The indirect costs, due to travel time and scheduling training, can also result in huge savings.

The price quote from NetG was $29,000/year for 1000 to 2499 users on ten different lessons. If all 2499 users use all 10 lessons, then the cost is $1.16 per lesson. Cost depends on the maximum number of employees fully utilizing the available lessons. If 1000 employees use five lessons, then the cost is $5.80 per lesson. In either scenario, the cost savings, when compared to DOA training, is significant.

Learn2 uses a different pricing scheme. Learn2 offers a 1 or 3-year contract. The 1-year contract costs $15/user (for Web access only). The 3-year contract costs $12/user. The MS Office training library has 16 courses and 40 titles. Therefore, the price is either $.94 or $.75 per course for each user.

Potential Problems

Using on-line interactive lessons, instead of live classroom instruction, would be a different way for INDOT to administer computer skills training. Several potential

problems exist with this method and must be considered before this recommendation is adopted.

Some employees may not learn effectively in this mode. Learners can typically be divided into active and passive learners. Active learners would perform well in self-directed environment, such as that offered through the on-line lessons. Passive learners learn best in classroom situations where more direction is provided. Individual differences in INDOT employees could determine the success of this recommendation.

Another potential problem is the opportunity for interruption. Students are not interrupted in the classroom, but could be more easily interrupted at their desks. Supervisors or other employees may not realize that they are in a training program. Can students learn effectively if frequently interrupted?

If the programs are not used, then the cost savings are reduced and the training problem is not resolved. Programs could be too difficult to use, employees may not be aware of the availability, or employees may not be able to find the time to do the program. Most of the vendors would help with resolving this problem either through assistance with marketing within the organization or through the technical support provided.

The incentive structure for the employees must change. Completing a class, in the set time period available, is usually an incentive in a traditional classroom. Completing a module to a satisfactory learning level needs to be an incentive in the new scenario. Outside incentives, such as certificates or commendations, may be needed. Employees could also be required to complete the courses to a specified competency level.

A different kind of expertise may be needed in the Training Division to administer this kind of program. Someone may be required to manage the training, market the training, and develop curricula. The vendors may help with the marketing to ensure that their product is utilized fully.

Implementation

This kind of program could be implemented in several ways. INDOT managers and supervisors have indicated a willingness and a need to jump into the new technology. However, a gradual program of implementation may be more appropriate. INDOT may want to test the effectiveness of these multimedia offerings before full implementation. A test could include a comparison of two or more vendors to determine which product is best for INDOT's environment and needs. A test comparing the effectiveness of multimedia training and classroom training may also be useful.

Implementation would require a policy change and additional staffing. INDOT should adopt a policy, similar to other state DOTs, to specify that employees be given time off to participate in computer-based instruction (CBI) activities at their desks. An additional coordinator on the Training Department staff would be needed to implement this training program.

Adopt policy to allow employees time off to participate in computer-based instruction (CBI) activities at their desks.

Additional staff member should be hired in the Training Section to manage the CBI program.

Basic and Interpersonal Skills Training

The second area of training recommendations is that performed by INDOT's Training Division. The current method of in-class training is best for the kinds of programs, such as leadership training, administered by this division. These kinds of topics require extensive interactions with the instructor and other students.

Current offerings through the training section in this area include the following.

- New Employee Orientation for Managers
- Advance Leadership
- Preventing Sexual Harassment
- Diversity Awareness
- Preventing Violence in the Workplace
- Selection and Interviewing
- The Basics of Leadership
- Implementing self-directed work teams
- How to make cross-functional teams work
- Working Skills
- INDOT PC classes
- Professional Telephone skills
- Time Management
- New Employee Orientation
- Intermediate Leadership
- Ethics Basics
- Ethics for Managers and Supervisors
- Ethics for Executives

Technical Training (Common to all Departments of Transportation)

Some needed training is common to all DOTs. To satisfy these general training needs, INDOT should make use of existing programs such as the courses developed and conducted by The National Highway Institute.

Facts

An analysis of INDOT engineering positions looked at job descriptions and tasks. The analysis also determined needed job tasks that were not included in current job tasks and what should be done to update skills in these needed areas.

The list of needed training areas was shown in Table 52. It was also determined that the current job descriptions were missing three key areas: Intelligent Transportation Systems, Information Technology, and Transportation Management Systems. The list of needed job tasks was shown in Table 53.

Recommendation

Use National Highway Institute courses, when available, to satisfy general transportation training needs of INDOT engineers.

Only some of the needed topics are covered through National Highway Institute(NHI) courses. An examination of the 1999 NHI course catalog revealed the available courses that could be used for training in these topics.. Table 57 shows the general technical topics that are covered or not covered. If the topic is covered by a course, then the course number is provided in the table.

TABLE 57. Identified Training Needs in General Technical Training and National Highway Institute (NHI) Course that Can Satisfy Need

Training Need	**NHI Course Number**
Quality Assurance/Quality Control	**13442**
Statistics/Process Control	None
Superpave Design Procedure	**13151, 13153**
Mechanistic/Empirical Pavement Design Procedures (2002 Design Guide)	None
New and Innovative Materials (e.g., Performance Graded Binders)	None
Use of Modified Materials	None
Non-Destructive Pavement Evaluation and Analysis	None
Non-Destructive Evaluation of Bridges (GPR)	**13023**
New and Innovative Materials for Rapid Maintenance	None
Scrub Sealing/Microsurfacing	None
Maintenance Quality/Performance Evaluation	None
Innovative Contracting Practices to Reduce User Cost	**13405**

Recommendation

Use other vendors or work with universities to develop short courses on topics of importance not covered by National Highway Institute courses.

NHI courses only covered a few of the topics in the general transportation area. We could find no courses to cover the important areas of Intelligent Transportation Systems, Information Technology, and Transportation Management Systems. Alternative vendors need to be found, courses need to be developed in house, or INDOT needs to work with college and university partners to develop the short courses. Tables 58 through 60 contain the list of topics in which course development is needed.

TABLE 58. Identified Training Needs in Intelligent Transportation Systems

Training Need
Information on ITS (national standards, case studies, etc.)
Training (new technologies and techniques)
Development of local standards consistent with the national ITS architecture
Coordination issues at the district level
Evaluation of new technologies and systems

TABLE 59. Identified Training Needs in Information Technology

Training Need
Information and training (GIS, linked databases)
Coordination of data sharing (other institutions, agencies)
Development and maintenance of linked or integrated databases
Internet-related tasks (data linking, security, access control, etc.)

TABLE 60. Identified Training Needs in Transportation Management Systems

Training Need
Safety
Congestion

Technical Training (Specific to INDOT)

INDOT currently does most of the training in house to satisfy specific INDOT needs. Following are recommendations for improving these training programs.

Facts

- INDOT personnel teach 50% of all training programs at INDOT.
- 71% of all training programs are duplicated across districts and divisions.

Recommendations

A method to share training material across districts, especially, and to a lesser extent, across divisions, is needed.

A list of courses that can be shared should be published and posted on a Web site or delivered to employees through e-mail.

Reporting and sharing of courses for training-related activities by job category should be mandatory.

Following are several possibilities for sharing and linking INDOT sites:

- Travel from one site to another
- Videoconferencing
- Media delivery (videotape, satellite, CD-ROM)
- Internet (Webcasts, streaming video on demand)

Currently, sharing and linking at INDOT is done through travel. The advantage to this method is that it is familiar and no hardware or software is needed. The big disadvantage is expense. Recall that about 80% of INDOT's training costs are due to indirect costs such as salaries when taking classes or when traveling to sites to receive the training. Reducing travel would be one method to reduce these costs.

With videoconferencing, training could be held at different sites with each site connected through the videoconferencing facility. Two-way interactive, live classes could be conducted. The problem with this method is that sites would need to purchase the hardware and software for videoconferencing. Although prices are coming down, the investment may still be high. Another problem is ease of use. Interactions with these methods are certainly not as good as live interactions. If students placed effort on how to interact with the equipment rather than learning the material, then the training environment suffers. Scheduling could also be a problem.

Videoconferencing has been investigated for meetings. One part of this study revealed time and travel costs for regularly scheduled meetings. The study was performed by INDOT in 1999 and reports mileage costs of $47,482 and salary costs of $187,238 annually for meetings. The largest training cost category is for employee slaries at $1,536,557. Using $25/hr. as the average salary then employee hours spent on

training is approximately 61,642. A certain percentage of these hours is travel time. How much is difficult to quantify. Using videoconferencing and other electronic delivery methods can save time and money. A videoconferencing cost analysis is being performed on a current JTRP project, Construction Data Management 2000, with the report available in June 2000.

The third method of linking, media delivery, is achieved through a satellite connection, or delivering lessons by videotape or CD-ROM. INDOT headquarters in Indianapolis currently has a satellite hookup through IHETS (Indiana Higher-Education Telecommunication System). Through this hookup, INDOT can receive programs from universities and colleges throughout Indiana and national programs, such as those produced by the National Technological University and PBS Learning Channel. This programming, however, is not available at district sites without the approximately $8500 cost of the satellite equipment. Delivery by videotape or CD-ROM is much less expensive and probably does not require any additional equipment. An additional advantage of tapes and CD-ROMs is that the programs can be viewed on demand; satellite transmissions are scheduled for certain times. The advantage of CD-ROM over videotape is that students could interact with the computer to answer questions or solve problems. Videotape has few interaction capabilities but, as such, is easier to produce. To produce a CD-ROM requires special software and equipment. The equipment for burning CD-ROMs, however, is becoming less expensive each year. A CD-ROM burner can be purchased for as little as $250.

The fourth possibility for linking is to use Webcasts and streaming video on demand. Both methods use computerized streaming video technology. Video requires huge amounts of Internet resources to broadcast through the Internet. Typical video runs 30 frames a second, and piping this amount of information through the Internet is impossible. Streamed video means that a small amount of the video is delivered to the user's computer, when needed, in a compressed format. A potential problem with streaming video is that the video will "freeze" on certain frames if the Internet connection is not fast enough. Typically, the minimum requirement for an Internet connection is 56 Kbits per second, which is not possible through conventional phone lines. Cable modems, DSL lines through the phone lines, or ISDN connections are sufficient for streaming video. The difference between Webcasts and streaming video on demand is that Webcasts are live broadcasts of streaming video and streaming video on demand can be accessed at will.

Recommendation

Consider delivering material through CD-ROM, Webcasts, and streaming video to share programs and link the different sites.

This may be the dominant technology in a few years, and INDOT should start developing a few programs to test the applicability of this technology to INDOT's needs. Once again, advantages and disadvantages are associated with this recommendation. An advantage is that most INDOT sites already have fast Internet connections and the

computer equipment to access programs delivered on the computer through the Internet. In many cases, no new equipment would be required; if INDOT's existing servers could be used to distribute the material. Some sites, however, especially in the districts, still rely on slow phone-line connections, and some employees do not have access to computers. Once again, the 80% of the training costs attributed to indirect costs, such as travel, means that upgrading some of the Internet connections and making computers available at common sites may be cost effective. Compressed video on a CD-ROM could be used as a delivery method for those sites with slow Internet connections.

Another potential problem is the development time needed to produce the programs. One of the advantages of streaming video, however, is that producing a video is much less expensive than other alternatives. As an example, a class session could be taped at one location and then distributed to other sites either as Webcasts, on-demand streaming video, or through CD-ROM (a CD-ROM can hold about five one-hour class sessions). This kind of delivery method is less expensive than developing interactive computer programs. It is faster, and could be cheaper, than delivering the tapes through the mail. A blank, recordable CD-ROM costs only about $.60, which is much cheaper than a blank videotape.

Another potential advantage is reducing the duplication of courses. The best courses could be distributed using this method. Over time, these best courses could also be improved by focusing development efforts on them instead of distributing efforts to produce the same thing over and over again.

We recommend that INDOT test the viability of CD-ROM, Webcast, and streaming-video delivery by choosing some of the high-cost classes that are duplicated across districts. The training-cost study we conducted found that the highest yearly training costs in the districts were associated with three training areas: safety ($514,852), construction ($301,949), and winter maintenance ($89,064).

We recommend that INDOT develop a sample CD-ROM, Webcast, or streaming video programs in one or more of these areas because the potential cost savings are large. A program can be developed from an existing training program in the following way. An existing program has to have a lesson plan. Choose the best lesson plan from the similar training programs that are duplicated across sites. In these areas, the trainers are also likely to use video to explain some of the concepts. The video can be used for this new format. In some cases, the trainer may have used PowerPoint slides to outline the material. The PowerPoint slides can be linked to the video. Therefore, with existing materials, a training program could be developed quickly and easily. Once developed, it could be developed and improved further with more effort and resources. In particular, if already distributed through the Internet or CD-ROM, computer interaction can be incorporated in the courses. Through computer interaction, students could be asked questions, the computer could automatically grade the questions, and the students would receive automatic feedback.

The current network infrastructure for the Department provides different capabilities that limit options for delivering training. The central office Local Area Network (LAN) has two architectures, token ring and Ethernet. Both are 10MB capacity. The plan is to upgrade to Fast Ethernet (100MB) architecture. The estimated cost is $80,000 to $100,000. The District offices have Fast Ethernet (100MB). Each district office is

connected to the main office through a T1 (1.5MB) line. Connection to the subdistricts is through a phone link.

Image quality is a very important issue in streaming video. Video can be streamed as low as 20kbps (kilobytes per second), which is the typical speed of a 28.8k modem. At this rate video quality is poor and the type is limited to a talking head with no motion. This is true even at current modem speeds of 56k. Decent video quality occurs at 100kbps, which is not possible over a dialup connection. But over the LAN and between the districts and the central office, this data rate is available.

With on-demand streaming video, individuals would access the video to fit their schedule. This could occur at all times of the day and would not tax the system as long as many users do not try to access the same lesson at the same time. Webcasts, however, are broadcast live so that many users at different sites could need to access the same stream. For an audience of 50 all at different locations, theoretically the bandwidth requirement would be 100 x 50 which is 5000 kbps or 5Mbps. The maximum data rate possible on the LAN in the central office is 10Mbps and to the districts at T1 the rate is 1.5Mbps. So this is not possible to stream to Districts. Even at the central office this would consume too much bandwidth. If the Webcast audience is 20 then the requirement is 2Mbps, which is still too large for these networks. Streaming is feasible in the fast Ethernet networks (100Mbps) that exists in the Districts. Realistically, Webcasts to multiple sites are not an option using the current infrastructure. On-demand streaming video, as long as multiple users do not try to access the streaming video all at the same time, would be an option with the current infrastructure.

Streaming video requires server software and places extra requirements on the hardware. For example, Real Networks is a major vendor. The latest streamer version is RealServer Plus 7.0. For 60 simultaneous streams and development software the price is approximately $2800. The RAM required for 50 streams at 100kbps is 124 MB. So the web server's RAM would have to be upgraded a minimum of this amount.

One solution to this video limitation is to place video content on CD-ROM disks and use the network to deliver the textual and image content. This hybrid approach has been used successfully in companies. This would require the trainee to insert the CD-ROM into the computer where training is occurring.

INDOT may need some assistance from outside vendors to start this process. If done correctly, programs developed using these techniques have the potential to increase the training effectiveness, increase the ease of accessing the material, and reduce overall training costs.

Fact

Much of the training is done in house, yet INDOT trainers provided with little instruction on how to train effectively.

Recommendation

Expand the train-the-trainer program. Training on hardware and software tools should be provided. Information about curriculum development should be provided.

Fact

Interviews with the trainers from the Human Resources Division and with INDOT employees who provide training found that trainers are not provided with adequate tools to perform their training functions effectively.

Recommendation

Software and hardware tools should be provided to the trainers to enhance the productivity of the training team.

Trainers indicated that they have skills in computer graphics and software that are currently wasted because they lack the software tools to utilize these skills in developing the presentation material. Funds should be invested in software tools, such as the computer graphics program PhotoShop LE (approximately $100), to utilize these skills.

Equipment is also needed to enhance productivity and to improve the quality of the training materials. The following equipment is needed:

- Color printers—this will allow trainers to take advantage of color in their presentations.
- Color scanner—can be used to insert color photographs and hand-written diagrams into presentation slides and other training documents.
- Laptop computers—these can be used for the presentations. Currently, trainers must use a cumbersome process to transfer PowerPoint slides into a Lite-Pro projector. Using laptops in the presentations will make the development of training material more efficient.
- Wireless microphone and PA amplifier—classes are often taught in large rooms where the students in the back cannot hear the presentation.
- LCD Projector—this can be connected directly to the laptop computer. Training material is of higher quality if projected from the computer instead of transferred from the computer to transparencies. Productivity could also be increased because extraneous steps can be eliminated.

Fact

Much of the training is on-the-job training.

Recommendations

Work to make the training more formal.

Select those who are good trainers and have knowledge of the job

Train the OJT trainers

Use formal lesson plans.

Formally evaluate effectiveness of OJT.

On-the-job training (OJT) can be both ineffectual and expensive. The effectiveness of OJT depends on the ability of the trainer, which can vary greatly between individuals and from day to day for the same trainer. Little consistency is usually seen. Since OJT is repeated over and over again, this kind of training can be expensive.

Fact

Job inventories were collected on a wide sample of INDOT jobs.

Recommendation

Use the job inventories as a resource to help make future training decisions for individual jobs.

Future training needs cannot be predicted accurately. The job inventories, included in this report, contains valuable information to make training decisions in the future. The job inventories list the tasks that the employees perform. These should be updated periodically to reflect changes in jobs duties. Employees would need to receive training to change to these new tasks.

As an example, assume that a high important duty, requiring a great deal of skill, currently is not performed well. This could indicate a need for training. But, the failure of the task could be due to problems in the job environment, such as faulty equipment or poor supervision. The whole environment must be addressed for training is specified.

Fact

Districts and divisions were asked to state their "best practices" in training.

Recommendation

Develop a method to share "best practices." Possibilities include a page on INDOT's intranet, meetings between groups, and formalizing training.

Since much of the training is informal and occurs in the districts and division, trainers should have the capability to share their best practices (some of these were listed in the "Results" section).

Fact

Employees receive few rewards for completing training.

Recommendation

Increase rewards for obtaining training and using new skills.

Fact

INDOT performs some assessment of training program effectiveness, but more effort is needed in this area.

Recommendation

Significantly increase the systematic assessment of training program effectiveness, particular trainer and supervisor assessments once the employee returns to the job.

Fact

The results from the training needs assessment provides a current snapshot. Training needs assessments should be performed continuously.

Recommendation

Training needs assessments, should be performed continuously.

Training Needs of Divisions and Districts

Specific training needs by various job categories summarized by divisions and districts are presented in this section. It should be noted that not all job categories or divisions are included. Only those with training needs identified through surveys and interviews are considered. Training needs at districts are grouped together and some of the need areas may not involve all districts.

Accounting and Control Division

Audit Examiner

One day of training is insufficient. Procurement skills are weak at various locations around the Department. Training needs to include various problems that typically occur and how to deal with them. All procurement areas need to be included in the training.

Design Division

Design Engineer

Training needed in technical and management areas. Specific training needs are the following:

- People and Management skills.
- Coordination and Integration with other government agencies.
- Information and Research searches.
- Pavement design.
- Creating new standard drawings in English and metric units.
- Writing specifications, design procedures, and field instructions.
- Design change procedures.
- Developing working plans.
- Understanding of applicable federal and state laws.
- How to develop rules and policies for permits and manuals.

Bridge Design layout.
Prestressed Concrete Girder design.

Most of the topics can be developed and delivered internally. The Design Division has pressing needs for training and delivery and availability is important. Some technical topics, e.g. prestressed concrete girder design, will need to come from outside sources.

Orientation for New Engineers

New engineers arrive at irregular intervals creating repetitive training cycles. Current design engineers are not able to adequately mentor because of scheduling and logistic uncertainties. The most effective method is making the training accessible in electronic form. Some of the above topics should be placed in electronic form. Also, general policies, regulations, work practices, employee benefits, etc. can be made available in this manner.

Engineering Assistant 1

Training needed on how to properly document procedures, records, and inventories.

Human Resources Division

Personnel Technician

1. Interviewing skills.
2. General office skills.

Operations Support Division

Intelligent Transportation System Training

National and regional symposiums and courses on this topic are the best way to learn from other organizations and the latest developments. One important area is to develop the capability to prepare a detailed state architecture for Indiana. One option for in-house training is to have mid-level personnel prepare short presentations on key technologies discussed and exhibited at these national and regional meetings. The exchange of ideas in these sessions will help INDOT employees identify critical standards and the issues involved in developing ITS. Specific training topics in this area are:

National standards.
Case studies.
New technologies and techniques.
Developing local standards.
Coordinating local, state, and national issues.

Planning and Programming Division

Developmental Specialist 1

1. Knowledge of applicable federal guidelines.
2. Understanding of engineering economy principles and environmental analysis.
3. Project planning techniques.
4. Long-range planning techniques.

Pre-Engineering and Environment Division

Environmental Scientist 3

1. Learn what and how are the legal environmental requirements.
2. Technical report writing.

System Technology Division

Administrative Analyst

1. Department computer systems and resources.
2. Computer systems and capabilities.
3. Trouble shooting computer problems.
4. Scheduling and managing computer support.

Senior Programmer

1. Programs and Systems Maintenance.

GIS Training

GIS is the preferred tool for many functions within the Department. The Data Processing Oversight Commission (DEPOC) has established the Environmental Systems Research Institute, Inc. (ESRI) software as the standard. General training on this software is a priority for this Division because of the number of functions that will utilize this software. It will be the responsibility of this Division to develop these applications and produce a policy for potential applications.

Linked or Integrated Databases

DEPOC has established database standards for various operating systems. The choices are DB/2, Oracle, SQL Server, and Access. Adequate training for developers is important because a significant amount of INDOT data is stored and maintained within

these software. Training should be provided for Internet accessibility and usage with these databases. The particular software vendors provide training and training on the advanced topics. Advanced training topics are important for this Division.

Internet Applications

In-depth training is needed in the areas of data linking, security, and access control. These skills and capabilities are very important for this Division as more applications are developed for the Internet. This type of training will come from outside vendors or conferences.

District Personnel

Engineering Specialist 2

1. Preparing right-of-way plans by analyzing survey notes.
2. Check right-of-way for railroad agreements, limited access facilities, clearance for private easements, mineral rights, leases, etc.
3. Write legal and technical documents to city, county, and state officials to appraise and acquire property for highway usage.
4. Review right-of-ways for compliance with policies, procedures, and specifications.
5. Perform a field check on survey data.
6. Coordinate activities between appraising and buying of right-of-way.

Subdistrict Manager

1. Develop prioritized schedules.
2. Develop annual work program.

Statistics/Process Control

Training on statistics used in process control of products used in transportation construction. This training is for inspectors, operators, and contractor personnel. This training is needed as the department utilizes more end result or performance based specifications.

Maintenance Quality/Performance Evaluation (District Training)

A Maintenance QA program is being developed and tested in the Laporte District. This program will be implemented state-wide to all districts. Training will describe the program, explain the rating and field sampling programs, and implementation issues.

Mechanistic/Empirical Pavement Design Procedures (2002 Design Guide) (Pavement Designers and District Training)

New AASHTO structural design in 2002 will be based on mechanistic principles. This training will present the general principles associated with this approach. Non-destructive testing procedures and the factors that influence mechanistic testing procedures and measurement techniques will be explained.

New and Innovative Materials and Techniques (District and Designer Training)

This is an evolving course on new materials, products, and processes for pavements, bridges, etc. For example the two areas of rapid maintenance and scrub sealing/microsurfacing.

Engineering Assistant (Certified Tech Training)

Course Description included in report.

Comments say the current course is out-dated and needs an overhaul. One of the major reasons is the specification changes are not reflected in the material. Training needs to be more extensive. Costs $37,300 each time it is offered. An electronic version will reduce delivery costs, provide a consistent quality message, allow for easier updating, provide pre-testing capability to determine competency level, offer different training tracks, and create more effective retraining opportunities.

Highway Maintenance Worker

Same material used for many years in snow removal training, so it needs updating with current practices and products. Training for this position needs to be delivered so that employees can access it when their time allows it. Most of their job functions cannot be suspended for training. Therefore, computer based instruction or web based training is the most effective delivery method for most of the training materials. New employee orientation information can be delivered more economically and effectively through an Internet or Intranet source.

All Divisions and Districts

Clerical

Computer Skills should be taught as a self-paced on the job experience through an electronic medium, CD-ROM. The current method of training is not effective.

Continuing Education

Facts

Many of the future training needs identified through the job analysis could not be trained through NHI courses and the expertise does not exist within INDOT to perform training in these areas. Outside vendors, such as colleges and universities, would be needed to teach these courses. These areas include:

- Quality
- Traditional transportation areas
- Intelligent transportation systems
- Information technology areas
- Project management

Several managers and supervisors indicated that hiring and retaining quality employees is difficult. Competition between INDOT and private companies is fierce. Some methods to hire and retain quality employees is needed.

Recommendation

The continuing education program should be highlighted and marketed to the engineers and technical personnel.

When potential employees consider job offers, the salary is not the only consideration in the decision to accept the offer. Potential employees also look for the possibility to improve and learn through continuing education. They are looking for a dynamic organization where new ideas are encouraged. Without providing these kinds of opportunities, talented people will not be attracted to INDOT. Continuing education can help to create a dynamic organization. It can help to create a stimulating environment that talented people would find fulfilling.

Continuing education comes in many forms. Short courses, lasting from one to 40 hours, are available. Academic courses from colleges and universities can be taken individually. In some cases, credits from college/university courses can be combined to obtain a certificate indicating a certain degree of technical achievement. Credits from college/university courses can also be used to obtain a Master's degree.

A potential problem with continuing education courses is that the course work may not be directly applicable to current jobs. Sometimes students question the relevance of the course material. Although this is a disadvantage, it can also be considered an advantage. Most of the continuing-education courses teach the students how to analyze and solve problems. With the technical knowledge expanding and changing rapidly, knowledge specific to a job or task may not be valuable or relevant beyond a two- to five-year time frame. Problem solving and analytical skills do not become obsolete over time.

Although the costs vary from school to school, we will use Purdue costs as an example. Through Purdue's Continuing Engineering Education program, the course tuition is $638. Most colleges and universities have certificate programs or would be willing to set up certificate programs in response to needs. A certificate would usually require from three to six courses. Ten semester-long courses are typically required to obtain a Master's degree.

Delivery methods vary from program to program. INDOT in Indianapolis has an IHETS site to receive programs from Indiana colleges and universities. Classes can also be delivered by videotape, CD-ROM, and through the Internet (either streaming video or computer interaction/animation courses).

Tables 53 through 56 contain the list of course topics that are not covered through short courses obtainable through NHI. Therefore, short courses in these areas are needed. With the rich variety of courses available from Indiana colleges and universities, INDOT should be able to find coverage for these topics. INDOT has particular needs in information technology, intelligent transportation systems, and transportation management systems.

Currently, INDOT has about 30 people involved in continuing education. INDOT pays 75% of the tuition (e.g., INDOT would pay $486 of the Purdue course tuition; the employee would have to pay $152). Employees are reimbursed a maximum of $1300 per year. Employees must stay at INDOT at least six months after completing the course.From our surveys, students complained about difficulties in registering for courses and receiving reimbursement for tuition costs. Many potential students are not aware of the program. INDOT needs to determine the source of the difficulties for reimbursement and registration. Some internal marketing of the continuing education programs may be needed.

In 1999, a Graduate Education and Training (GET) initiative was established between INDOT and the Joint Transportation Research Program (JTRP) at Purdue University. GET is to select three to five INDOT employees each year to spend one semester at Purdue University conducting graduate research and performing a guided study. INDOT will pay the participant's salary during the semester on campus, and JTRP will provide a stipend to assist with living expenses in addition to the payment of tuition and fees. The course credit obtained during this semester on campus can be used to independently pursue an advanced degree. Funding for additional coursework is available through the educational assistance program.

Summary

This section contains numerous recommendations for the five training areas: computer skills, human resource training, training through national standardized courses such as NHI, specific customized training for individual job classifications, and continuing education primarily at the graduate level. These areas together represent a broad range of training possibilities

Results from the training needs survey have been summarized in this section. Revealed in the survey is the fact that INDOT invests a small amount of resources in training compared to other organizations. The majority of training costs (60%) is due to the salaries of the employees attending training. The amount spent annually per employee on training in the private sector is **$1526**. This is compared to INDOT's **$168**. This is at a level that does not provide a minimum level of training support. Extra resources must be dedicated or the following specifics cannot be addressed.

Computer skill courses need to be expanded in content and availability. Training for Microsoft Office Suite products and other popular software tools such as browsers can be delivered economically and efficiently through computer-based training. Information from vendors reveals courses costing as little as $1.00 each. One quote received was

$29,000 for 10 lessons. This training is economical and provides the type of training needed in this area.

NHI-type training courses provide training on technical subject areas. These subjects are common in the transportation industry and costs for this training are low. However, the subject coverage is limited and only a few training needs can be met with these generic courses. The vast majority of technical training needs have no formal training tools.

A centralized coordinated plan for developing and delivering this technical training across Divisions and Districts is necessary and a high priority. Subject areas have been identified and intranet-based or computer-based content and delivery with the infrastructure limitations described in this report is the preferred option. For example the long range research plan developed by INDOT has identified bridge design and bridge layout as important areas for training. The Design Division has important training needs due to designer turnover. By transferring delivery to electronic options, money can be saved in travel and employee time with some of these resources shifted to training. A prioritized list of training topics should be developed through the training section and a development and support budget produced.

The need for training has been documented in this report. One particular finding is disturbing. Table 51 shows that employee performance is low across many job classifications. It is particularly low for technical and engineering classifications. With current job demands high at these classifications and expected to increase, training is a necessity. INDOT must embark on a renewed emphasis on training to improve the current workforce and prepare for today's needs but also the coming challenges.

Training Needs by Divisions

Accounting and Control Division

Audit Examiner

One day of training is insufficient. Procurement skills are weak at various locations around the Department. Training needs to include various problems that typically occur and how to deal with them. All procurement areas need to be included in the training.

Design Division

Design Engineer

Training needed in technical and management areas. Specific training needs are the following:

People and Management skills.
Coordination and Integration with other government agencies.
Information and Research searches.
Pavement design.
Creating new standard drawings in English and metric units.
Writing specifications, design procedures, and field instructions.
Design change procedures.
Developing working plans.
Understanding of applicable federal and state laws.
How to develop rules and policies for permits and manuals.
Bridge Design layout.
Prestressed Concrete Girder design.

Most of the topics can be developed and delivered internally. The Design Division has pressing needs for training and delivery and availability is important. Some technical topics, e.g. prestressed concrete girder design, will need to come from outside sources.

Orientation for New Engineers

New engineers arrive at irregular intervals creating repetitive training cycles. Current design engineers are not able to adequately mentor because of scheduling and logistic uncertainties. The most effective method is making the training accessible in electronic form. Some of the above topics should be placed in electronic form. Also, general policies, regulations, work practices, employee benefits, etc. can be made available in this manner.

Engineering Assistant 1

Training needed on how to properly document procedures, records, and inventories.

Human Resources Division

Personnel Technician

1. Interviewing skills.
2. General office skills.

Operations Support Division

Intelligent Transportation System Training

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All Divisions and Districts

Clerical

Computer Skills should be taught as a self-paced on the job experience through an electronic medium, CD-ROM. The current method of training is not effective.

Training Questionnaire

Job Category: _____ (filled in by us)

Following is a series of questions about the training provided to INDOT employees. We are seeking information only about training programs that are somehow organized, developed, or provided by Human Resources Division's Training Department.

We are also only seeking information about FORMAL training. By formal training, we mean seminars, workshops, and/or courses that employees attend, no matter whether they are presented on or off site or by INDOT, a vendor, or a consultant. Formal training does NOT include any form of on-the-job training in which managers or peers show inexperienced employees how to perform their jobs.

Section I of the questionnaire requests information which should relate to all of the training provided for **(job name filled in by us).**

We are also interested in specific information about the various training programs with which you may be knowledgeable. Therefore, Section II should be answered separately for each training program about which you are knowledgeable. Since you may be knowledgeable about several different training programs, we have included five (5) copies of Section II of the questionnaire. If you are knowledgeable about more than five (5) different training programs, please make additional copies of Section II for those programs.

Job Category:_____ **(filled in by us)**

Section I.

A. What are your training responsibilities? Please check all that apply.

_____ Administration of training programs (e.g., scheduling, organizing, purchasing, granting permission to take courses)
_____ Instructional design
_____ Choosing off-the-shelf training programs or materials
_____ Working with vendors to develop training programs or materials
_____ Determining what skills need to be trained
_____ Determining which employees need to be trained
_____ Assessing training pro-ram effectiveness
_____ Teaching
_____ Other. Please
_____
_____

B. If all training for this job is taught by vendors or consultants, check here and go to 'C' on the following page: _____

When INDOT employees teach workshops, seminars, and/or courses, to what extent are they selected based on:

	Not at all				Completely
1. teaching skill	1	2	3	4	5
2. technical skill	1	2	3	4	5
3. their interest in doing training	1	2	3	4	5

Answer the following question if INDOT employees who teach workshops, seminars, and/or courses take a train-the-trainer course.

	Not at all				Completely
(5) How comprehensive is the train-the-trainer course?	1	2	3	4	5

C. Please answer the following questions in relation to the focal job. To your knowledge, to how frequently do the following occur?

	Very infrequently				Very frequently
1. Supervisors expect trainees to make use of their training back on the job.	1	2	3	4	5
2. Supervisors do not seem to care whether trainees use the skills and knowledge learned in training.	1	2	3	4	5
3. Supervisors help trainees set realistic goals for job performance based on their training.	1	2	3	4	5
4. Supervisors make sure that trainees have the opportunity to use their new skills and knowledge immediately back on the job.	1	2	3	4	5
5. Supervisors & trainees discuss problems with using the new skills and knowledge on the job.	1	2	3	4	5
6. Supervisors oppose the use of skills and knowledge learned in training.	1	2	3	4	5
7. Trainees are told they are performing incorrectly when they use the skills and knowledge learned in training.	1	2	3	4	5
8. Supervisors & trainees discuss how to apply the new skills and knowledge on the job.	1	2	3	4	5
9. Super-visors pay only lip service to the value and usefulness of training.	1	2	3	4	5
10. Super-visors have trainees share their training experience and learning with co-workers back on the job.	1	2	3	4	5
11. Supervisors do not notice when trainees use their new skills and knowledge learned in training.	1	2	3	4	5
12. Supervisors have the technical knowledge to help trainees use the new skills and knowledge learned in training.	1	2	3	4	5

	Very infrequently				Very frequently
13. Supervisors give job instructions to trainees which are consistent with what was learned in training.	1	2	3	4	5
14. Supervisors show interest in what trainees learned in training.	1	2	3	4	5
15. Super-visors ease the pressures of work for a short time so trainees have a chance to practice their new skills.	1	2	3	4	5
16. Co-workers expect trainees to perform their jobs in a manner consistent with what was taught in training.	1	2	3	4	5
17. Co-workers have the technical knowledge to help trainees use the skills and knowledge learned in training.	1	2	3	4	5
18. Co-workers ridicule the use of the skills and knowledge learned in training.	1	2	3	4	5
19. Co-workers help trainees resolve problems with using new skills and knowledge back on the job.	I	2	3	4	5
20. The characteristics of the trainees' job facilitate the use of skills and knowledge learned in training.	1	2	3	4	5
21. Training aids are available on the job to support the use of new skills and knowledge.	1	2	3	4	5
22. Equipment and materials are available to facilitate the use of new skills and knowledge back on the job..	1	2	3	4	5
23. Trainees receive monetary rewards (e.g. bonuses, pay raises) for successfully using the skills and knowledge learned in training.	1	2	3	4	5
24. Trainees receive non-monetary rewards (e.g. praise, recognition, autonomy, responsibility) for using the skills and knowledge learned in training.	1	2	3	4	5
25. Trainees who use their new skills and knowledge 2		1	3	4	5

Name of job category:_____(filled in by us)

Section II.

Please use separate copies of this section to answer questions about each individual training program about which you are knowledgeable. We have included five (5) copies for your convenience.

In addition, for multiple-skill training programs, please fill out a separate questionnaire for each component. For example, if a single training program includes a portion on orientation, a portion on a technical skill and a portion on working in teams, you would complete three (3) separate copies of the questionnaire.

Please fill in the name of the training program:

Please attach a lesson plan or training outline, if one is available.

1. To your knowledge, is this or similar training provided at other INDOT districts and/or divisions?_____Yes _____No

If you answered yes to the above question, please indicate the names of the district(s)/division(s) where the training occurs.

_____

_____

_____

_____

_____

2. If you answered 'Yes' to question (1), how much coordination of effort for this training program takes place between your division/district and the other division(s)/district(s) regarding:

	None				A Great Deal
(a) Constructing a training needs analysis	1	2	3	4	5
(b) Instructional design	1	2	3	4	5
(c) Monetary cost sharing (e.g., videos, equipment, consultants' fees, materials, off-the-shelf programs)	1	2	3	4	5
(d) Teaching the training program	1	2	3	4	5

3. Please list the objectives of this training program. If the objectives are listed on an attached lesson plan or training outline, there is no need to list them again here.

_____
_____
_____
_____
_____

4. Is the length of the training program sufficient to reach its objectives? (Check one.)

_____ Too short
_____ Appropriate length
_____ Too long

5. Which of the following training methods are used in this training program? (Check all that apply.)

_____Video

_____ CD-ROM

_____Web-based instruction

Lecture

____Case studies

____ Distance Learning, or programs that take place with trainer and trainees in different locations.

_____Simulation

_____Self-directed learning modules

_____Other. Please specify:

_____

_____

_____

6. What percentage of the funding for this training program comes from the Human Resources Division's Training Department? _____ % Check here if you do not know ____

7. Was the training program (Check all that apply, and fill in the cost):

Developed in-house by your department of some other department. What was the approximate cost of development? $ _____
What was the approximate cost to your office in particular? $_____

Purchased off-the-shelf.
What was the cost of the program? $_____
What was the cost of the program to your office in particular? $____

Purchased, but tailored for INDOT's needs.
What was the cost of the program? $_____
What was the cost of the program to your office in particular? $_____

8. Is the training program taught by (Check all that apply):

_____INDOT staff
_____ A consultant
_____ A vendor
_____ A government agency other than INDOT (e.g., Indiana Dept. of Natural Resources, Federal Highway Administration.)
_____ Other (please specify)

_____

_____

9. How many years ago did the training program begin? Approximately _____years ago.

10. On average, how many trainees participate in this training program each year?

11. Each time this training program is offered, what is the approximate cost incurred by your division or district(including materials, room rental, salaries of trainers, salaries of trainees in attendance, etc)? $_____

_____ Trainee reactions: written evaluations from trainees
_____ Knowledge tests
_____ Work samples at the end of training
_____ Supervisor performance evaluations back on the job
_____ Evaluations by trainer back on the job
_____ Self-evaluations back on the job
_____ None
_____ Other. Please specify_____
_____
_____

	Very poor				Excellent
13. In your view, how effective is this training program in terms of meeting its objectives?	1	2	3	4	5
	Never				Very often
14. How often do supervisors have the opportunity to observe their subordinates performing the new skills they learn from this training program back on the job?	1	2	3	4	5

15. Please provide any additional comments about this program that you feel would contribute to the development of training programs and practices at INDOT.

_____

_____

_____

_____

_____

_____

_____

_____

Main Interview Questions

Prompts

Approximately how many people require formal training on an annual basis in your division?

- 0 to 5
- 6 to 20
- 21 to 40
- 41 to 60
- 61 to 80
- 81 to 100
- 101 to 150
- 151 to 200
- 201 to 300
- 301 to 400
- 401 to 500
- 501 to 750
- 751 to 1000
- 100 1 or more

- How many people in your division?
- What types (in general) Show List.
- How often does training occur?
- Not including on-the-job or recertification training

In general, what are the most frequent training activities that go on in your division?

_____
_____
_____
_____

- What jobs are the most critical to your success
- Do you focus most of your training efforts there?
- where and why?

How much of the training is done in house? out sourced? schools/classes? video? Give your best % estimate.

- In house (not including video) Out _____%
- Sourced (people hired to come to INDOT) Schools/classes (sending _____%
- employees away to classes, seminars, training) _____%
- Video or similar media _____%

- What is your most common training?
- Give an "off the top of your head" list and describe

How do you currently assess the effectiveness of your training?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

- Attitude survey?
- Observations Job performance evaluations
- Product/work inspections
- Post-Training testing?
- On-the-job testing
- Peer evaluations
- Controlled experiments
- etc.

- **HOW EFFECTIVE WAS THE TRAINING ON JOB PERFORMANCE?**

Main Interview Questions

Prompts

What kind of additional training would increase the performance of your division/district? (Outside of HR training services?)

- Computer training?
- Personal skills upgrades?
- Equipment?

_____
_____
_____
_____
_____
_____
_____
_____

What are your feelings/attitudes towards the training services provided to your division/district by the Human Resources department (diversity, violence in the workplace, etc.)

- Very Satisfied
- Satisfied
- Neutral
- Dissatisfied
- Very Dissatisfied

_____
_____
_____
_____

Towards training services provided by outside vendors/consultants?

- Very Satisfied
- Satisfied
- Neutral
- Dissatisfied
- Very Dissatisfied

- Outside classes
- Video Tapes
- Consultants
- External Trainers

_____
_____
_____

Towards training designed and conducted internally by your own division / district?

- Very Satisfied
- Satisfied
- Neutral
- Dissatisfied
- Very Dissatisfied

Main Interview Questions

Prompts

12. In the 2-4 years, how do you see job duties in your division / district changing or evolving?

(All beyond what you have today)

- Are there any new technologies coming soon?
- What about things like: CAD, Office Automization, ITS, Construction Field Data, etc.?
- Any important corporate structure or management style changes?
- Management, quality, technical, skill upgrade programs?
- Required federal training?

13. How will these changes affect the job?

- Will a mean of change in efficiency, quality?
- A change in communications
- A change in work environment, morale, motivation
- Shifts in skills?
- Shifts in your division's top priority?

14. How do you feel this will impact training for your division?

- Will it bring about a need for "higher tech" training methods?
- Transfer of training?
- Require a shift in methods, training personnel, resources?
- Increase the need for training or lower the
- Changes in effectiveness evaluation

Main Interview Questions

Prompts

15. Beyond 4 years, how do you see job duties in your division/district changing or evolving?

_____
_____
_____
_____
_____
_____

(All beyond what you have today)

- Are there any new technologies coming soon?
- What about things like: CAD, Office Automation, ITS, Construction Field Data, etc.?
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_____
_____
_____
_____
_____
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17. How do you feel this will impact training for your division?

_____
_____
_____
_____
_____
_____
_____

- Will it bring about a need for "higher tech" training, methods?
- Transfer of training?
- Require a shift in methods. training personnel, resources?
- Increase the need for training or lower the need
- Changes in effectiveness

Main, Interview Questions

Prompts

18. What do you consider you division's current "Best Practices" are as far as training is concerned?

_____
_____
_____
_____
_____
_____
_____
_____
_____

- What is the best training practice you currently have
- Include all aspects of the division: clerical, computers, efficiency, communications, office automation, field training,

19. What do you feel your division could do more effectively in terms of training?

_____
_____
_____
_____

20. Do you see a role for multimedia and computers in your division's future training activities? If so, please tell me how you envision utilizing Computer Assisted Instruction. (skip if already covered)

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

- Examples would include:
- simulations
- interactive multimedia
- internet information/training
- Intelligent Transportation Systems training
- virtual reality
- interactive CD-ROM "trainers"
- Self-paced tutorials via. CD-ROM
- "Trainer-less" training sessions.

Interviewer's Name: _____
Interviewee's Name: _____
Division/District: _____
Date Completed: _____
Start Time:_____ am/pm Finish time: _____ am/pm

Table 1: Job Inventory Survey for Administrative Analyst (1AA2)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b]	Type of training received for duty[c]		Location
					Received in the last two years (rated by incumbents)	Available to employees (rated by supervisors)	
Trains employees in new procedures, and sets up programs for the training of new employees.	4	4	4	3	FT & OJT	FT & OJT	-Operations
Develops Agency computing systems.	3	5	5	3	FT & OJT	OJT	-Operations
Computer problem resolution.	5	5	5	3	FT & OJT	OJT	-Operations
Computer Support for agency	5	5	5	3	FT & OJT	FT & OJT	-Operations

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job.

Responses
- Four questionnaires were sent out. Two responses were received, one from a supervisor.
- Incumbent was from a division, supervisor was from a district.
- Data was not available on the length of the incumbent's tenure.

Table 2: Job Inventory Survey for Senior Programmer (1 AB 4)
(Respondent is in Systems Development)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b]	Type of training received for duty in the last two years[c] (rated by incumbents)
Tests and debugs assigned programs, generating comprehensive test data as needed	4	4	5	4	OJT
Performs unit tests, coordinating program testing and validating unit results.	3	4	4	4	OJT
Provides computer operation instructions utilizing an interpretive language for programs and various utilities.	3	3	3	3	OJT
Serves as assistant to systems analyst in program and systems maintenance for the team.	3	5	4	3	OJT

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job.

Responses
- Four questionnaires were sent out. One response was received from a supervisor.
- Respondent was from a division.

Table 3: Job Inventory Survey for Software Specialist 3 (1 AF 3)
(Respondents are in operations division)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b] [3]	Type of training received for duty in the last two years[c] (rated by incumbents)
Participates in the generation and maintenance of the most current version of the operating system	5	5	5		NT
Researches new techniques and technical developments to be utilized by operations to enhance system performance	4[1]	4[1]	4.5		OJT, NT
Installs and maintains various computer software packages	4.5	4.5	4[1]		OJT, NT
Creates and maintains general utility programs	3.5[2]	3.5	4.5		OJT, NT
Provides technical assistance and written guidelines for operations personnel as needed	3.5[2]	3.5	4.5		FT, NT
Monitors system performance in selected areas and implements necessary changes to improve performance when possible	4[1]	4[1]	5		OJT, NT

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b] [3]	Type of training received for duty in the last two years[c] (rated by incumbents)
Studies hardware and software proposals to determine the impact on existing configurations	2	2	5		OJT
Establishes and writes procedures and guidelines for system operation	3.5[2]	3.5[2]	4.5[2]		FT, NT
Oracle database administration.	5	5	5		FT

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job. Multiple entries on one line indicate disagreement as to training provided within a division or district.
[1]Difference of two scale points between respondents.
[2]Difference of three scale points between respondents.
[3]No responses were received from supervisors.

Responses
- Four questionnaires were sent out. Two responses were received.
- Respondents were from divisions.
- Incumbents have held their current positions for between two and five years.

Table 4: Job Inventory Survey for Highway Engineer 1 (1DC1)
(Respondent is from Research Division)

Duty Performed	Frequency of performance of duty[a 1]	Importance of duty to job[a 1]	Skill required to perform duty[a 1]	Overall performance of employees[b]	Type of training available to employees[c] (rated by supervisors)
Coordinates division activities with other State agencies as well as out-of-state, Federal and local agencies sharing jurisdiction.	4	5	4	3	OJT
Identifies, establishes and prioritizes research needs.	4	5	5	4	FT & OJT
Prepares research proposals and reports, and provides tech. Presentations and training.	4	5	5	4	FT & OJT
Supervises, directs and evaluates section engineers and support staff.	3	4	4	3	OJT
Conducts research using statistical, analytical and data processing skills.	4	5	5	4	NT
Coordinates research activities with National Associations; Federal, State and local agencies; contractors and	3	4	3	3	OJT

Duty Performed	Frequency of performance of duty[a 1]	Importance of duty to job[a 1]	Skill required to perform duty[a 1]	Overall performance of employees[b]	Type of training available to employees[c] (rated by supervisors)
consultants; and university faculty.					
Evaluates new technology and assists with departmental implementation of technological and research findings.	4	5	5	4	FT & OJT
Oversees, directs and maintains section budget and approves budget expenditures.	2	3	3	3	OJT
Assists with research project administration, serves on technical panels and committees.	3	4	5	3	FT & OJT
Coordinates and performs information gathering, library searches and technology transfer.	3	5	4	3	FT & OJT

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job.
[1]No data was received from job incumbents.

Responses
- Six questionnaires were sent out. One response was received from a supervisor.
- Respondent was from a division.

Table 5: Job Inventory Survey for Highway Engineer 2 (1 DC 2)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b]	Type of training received for duty[c]		Location
					Received in the last two years (rated by incumbents)	Available to employees (rated by supervisors)	
Coordinates subordinate squad members in accomplishing highway design functions.	2	3	2.5	4	OJT	OJT	-Tech Services -Mat. & Tests
Prepares complete working plans.	3.5	4.5	3.5	3	OJT	OJT	-Tech Services -Mat. & Tests
Reviews and prepares pavement designs.	3.5[2]	4.5	5	3	OJT	OJT	-Tech Services -Mat. & Tests
Coordinates technical assistance with other agencies.	5	5	5		OJT		-Mat. & Tests
Assists in preparing engineering reports and studies.	4	4	4		NT		-Mat. & Tests
Communicates with government officials and the public.	5	5	5			OJT	-Tech Services
Elaborates new standard documents and creates new standard drawings in English and metric units. Writes standard specifications, new design procedure and field	3.5	5	5	3	OJT	OJT	-Tech Services

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b]	Type of training received for duty[c]		Location
					Received in the last two years (rated by incumbents)	Available to employees (rated by supervisors)	
instructions.							
Revises standard documents due to new industry requirements, modification after crush-tests or changes going together with Design manual.	4.5	5	4.5	3	OJT	OJT	-Tech Services
Prepares correspondence, engineering reports and studies.	4	4	4		OJT		-Tech Services
Offers and holds training for consultants with instructions and specifications writing or building-specific contract requirements.	2	5	5		OJT		-Tech Services

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job. Multiple lines indicate differences between divisions and/or districts.
[1]Major disagreement between respondents.

Responses
- Nine questionnaires were sent out. Three responses were received, including one from a supervisor.
- All respondents are from divisions.
- Both incumbents have held their current positions for between two and five years.

Table 6: Job Inventory Survey for Highway Engineer 3 (1 DC 3)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 3]	Type of training received for duty[c]		Location
					Received in the last two years (reported by incumbents)	Available to Employees (reported by supervisors)	
Computational tasks.	5	5	3		NT[2]	NT	-LaPorte
Prepares working plans.	4	5	3[1]	3.5	OJT, NT NT[2]		-Ft. Wayne -LaPorte
Designs bridges/ analyzes bridge ratings.	4[1]	4	4	5	OJT NT	FT & OJT NT NT OJT	-Greenfield -Research, -LaPorte -Vincennes
Supervises and directs field investigators for data collection.	5	5	3.5[1]	4.5	NT FT & OJT NT	OJT OJT	-Mtrls Tests -Vincennes
Prepares analysis and investigative reports for engineering studies.	4.5	4.5	4		OJT NT	FT & OJT	Greenfield LaPorte
Reviews traffic impact studies and plans (signals, etc).	4.5	4.7[1]	5		OJT FT & OJT	FT & OJT	-Research -Ft.Wayne
Composes technical letters of correspondence/ corresponds with other utility companies regarding technical plans.	4.3	4.6	3.6	4	OJT	OJT	Vincennes

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b] [3]	Type of training received for duty[c]		Location
					Received in the last two years (reported by incumbents)	Available to Employees (reported by supervisors)	
Designs Intelligent Transportation Systems.	4	4	5		OJT		-Research
Supervises construction tasks and technical personnel (programmers).	4[1]	4.5	4.5		NT[2]	NT FT & OJT	-MtrlsTsts, LaPorte -Ft. Wayne
Supervises distribution of funds.	5	5	5		NT	NT	LaPorte
Keeps abreast of federal and state laws.	2	5	3	3	OJT		Mtrls Tests
Develops rules and policies re. Permits, and policy manuals.	5	5	2	3	FT & OJT	FT&OJT	-MtrlsTests
Provides recommendations to executive office/ coordinate activities with districts.	5	5	4.5	4.5	OJT	OJT, FT & OJT	Ft. Wayne
Compiles design contracts.	5	5	4	4	OJT	OJT	Ft. Wayne

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job. Multiple entries on one line indicate disagreement as to training provided within a division or district. Multiple lines indicate differences between divisions and/or districts.
[1]Difference of two scale points between respondents.
[2]Respondent has been on the job for less than six months.

Duties that supervisors did not rate the performance of are those that they listed as not being performed at all.
Responses
- Thirty questionnaires were sent out. Eleven responses were received, including four from supervisors.
- Six respondents were from districts and five respondents were from divisions.
- One incumbent has held the current position for less than six months. Two incumbents have held the current position for between six months and two years. The rest have held the current position for more than two years.

Table 7: Job Inventory Survey for Surveyor 2 (1 DS 2)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 3]	Type of training received for duty[c]		Location
					Type of Training Received in last 2 years (reported by incumbents)	Available to employees (reported by supervisors)	
Plans and coordinates each phase of the survey and schedules activities to make effective use of resources and meet schedules.	4[2]	4.6	4	4	OJT	OJT FT & OJT	-Design -Ft. Wayne, Info Services -Vincennes, Greenfield
Directs the survey party in what areas and locations to survey, providing technical guidance for unusual or exceptional situations.	4[1]	4.6	4.6	4[1]	FT & OJT	Ft & OJT OJT	-Design -Ft. Wayne, Info Services -Vincennes, Greenfield
Reviews and checks topography work to verify form, content, clarity and any unusual features.	3.6	4.6	4.6	4.5	FT & OJT	OJT FT & OJT	-Design -Ft. Wayne, Greenfield -Vincennes
Ensures that each property owner is advised	3.5[2]	4.5	2	4[1]	OJT	OJT	-Design -Ft. Wayne,

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 3]	Type of training received for duty[c]		Location
					Type of Training Received in last 2 years (reported by incumbents)	Available to employees (reported by supervisors)	
of survey and the need to enter on private property, and that owner is personally contacted prior to entry, if possible.						FT & OJT	Vincennes, Greenfield -Info Services
Instructs and trains each member of the survey crew on assigned work tasks.	3.3	4.3	3.6	4	OJT	OJT FT & OJT	-Design -Ft. Wayne, Greenfield - Info Services, Vincennes
Supervises and participates as needed in all phases of the survey, including operation and proper use of all survey instruments and tools.	3	4.6	3.6	4	OJT	OJT FT & OJT NT	-Design -Ft. Wayne Info Services -Vincennes
Keeps inventory records for equipment and vehicles, keeps attendance, payroll and expense records.	2.3[2]	2.6	2.3	3.5	OJT	OJT FT	-Design -Ft. Wayne, Info Services, Greenfield -Vincennes
Meets with property owner and processes claims for crop damages if required.	2	3.5	3.5	3.5	OJT	FT & OJT OJT FT	-Design -Ft. Wayne, Greenfield -Info Services -Vincennes
Establishes horizontal and vertical control using data derived from benchmark, section corner, property	4	4.5	4.5	4	FT & OJT	FT& OJT	-Design -Ft. Wayne, Info Services, Vincennes,

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 3]	Type of training received for duty[c]		Location
					Type of Training Received in last 2 years (reported by incumbents)	Available to employees (reported by supervisors)	
corner, centerline points, etc.							Greenfield
Participates in review and establishment of production standards and ensures that subordinates are familiar with them.	4	4	4	3.5[1]	OJT	OJT FT & OJT	-Design -Ft. Wayne -Info Services
Prepares recommendations for new or additional equipment, personnel, supplies, etc.	3	4	3.5	4	FT & OJT	OJT FT & OJT	-Design -Ft. Wayne -Vincennes, Greenfield
Counsels subordinates in performance standards, provides guidance on objectives, resolves grievances, conducts performance appraisals, recommends personnel actions, etc.	3	4.6	4	4	OJT	OJT FT & OJT FT	-Design -Ft. Wayne, Greenfield -Info Services -Vincennes
Draws CADD maps and charts.	3.5	4	5	5	FT & OJT		-Design
GPS Survey for control field processing.[2]	4	4	5		FT & OJT		-Design

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job.

[1]Difference of two scale points between respondents.
[2]Duty performed by one respondent only.
[3]Duties that supervisors did not rate the performance of are thos that they listed as not being performed at all.

Responses
- Eight questionnaires were sent out. Five responses were received, including four from supervisors.
- Three responses were from districts and two respondents were from divisions.
- The incumbent has been in the current position for between two and five years.

Table 8: Job Inventory Survey for Engineering Specialist 2 (1 DT 2)
(All respondents are from the Land Acquisition Division)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 3]	Type of training received for duty[c]	
					Received in the last two years (rated by incumbents)	Available to employees (rated by supervisors)
Analyzes, prepares, and writes legal descriptions and various other instruments such as warranty deeds, quitclaim deeds, right-of-way grants, release of leasehold, etc. with regard to land ownership or rights.	5	5	5	2	FT/ OJT, NT	OJT
Converts construction plans and survey notes to right-of-way plans by plotting property descriptions from abstracts, plotting easements, establishing property lines, residuals and existing right-of-ways.	5	5	5	3	FT/ OJT, NT	OJT

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 3]	Type of training received for duty[c]	
					Received in the last two years (rated by incumbents)	Available to employees (rated by supervisors)
Checks and reviews each completed parcel prepared by squad members to ensure that no conflicting surveys or boundary evidence is encountered and that such decisions are adequately supported by written documentation.	3.3[1]	3.6[1]	4[1]	3	NT	FT & OJT
Analyzes and reviews old grants with new plans to ensure that existing boundaries are correct; researches legal documents to secure the necessary information.	4[1]	5	4.5	3	FT & OJT, NT	OJT
Interprets, reviews, and analyzes field survey notes to ensure that the surveys taken in the field correspond with construction plans, deeds, and grants in order to prepare right-of-way plans.	5	5	5	2	FT & OJT	OJT
Reviews coding data forms to be run through computer to obtain bearings, distances, and areas used within deeds.	3.5[2]	3.5[2]	3.5[2]	3	NT	NT
Collects and analyzes the technical data furnished by Highway Commission surveyors, county surveyors, and engineering firms	5	5	5		FT & OJT	

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 3]	Type of training received for duty[c]	
					Received in the last two years (rated by incumbents)	Available to employees (rated by supervisors)
concerning the acquisition of right-of-way land.						
Checks each right-of-way project for all special provisions applying to the project such as existing right-of-way, railroad agreements, limited access facilities, clearance of private easements, mineral rights, leasehold rights, etc.	4.5	5	5	2	FT & OJT	OJT
Writes various legal and technical documents, reports and letters to various City, County and State officials requisite for the appraisal and acquisition of real estate for highway purposes.	2.3	3.3[1]	4[1]	1	NT	OJT
Reviews right-of-way plans, descriptions, and land plots prepared by consulting engineers for compliance with policies, procedures, and specifications.	4[1]	5	4.6	1	FT & OJT	OJT
Performs occasional field checks in order to clarify discrepancies in pre-existing survey data.	2.5	5	4	1	NT	OJT
Coordinates department activities with the appraising and buying	2.5	5	4	3	NT	OJT

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 3]	Type of training received for duty[c]	
					Received in the last two years (rated by incumbents)	Available to employees (rated by supervisors)
section.						

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job. Multiple entries on one line indicate disagreement as to training provided within a division or district.
[1]Difference of two scale points between respondents.
[2]Difference of three scale points between respondents.
[3]Duties that supervisor did not rate the performance of are those that s/he listed as not being performed at all.

Responses
- Four questionnaires were sent out. Two responses were received.
- Both respondents were from divisions.
- Both incumbents have held their current positions for between two and five years.

Table 9: Job Inventory Survey for Construction Engineer 3 1 DZ 3)
(All respondents are from Ft. Wayne)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b]	Type of training received for duty[c]	
					Received in the last two years (rated by incumbents)	Available to Employees (rated by Supervisors)
Researches and processes contractor retainage release requests.	4	5	4.4		OJT, NT	
Reviews and assembles construction record documents for close-out.[1]	5	5	4		OJT	

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b]	Type of training received for duty[c]	
					Received in the last two years (rated by incumbents)	Available to Employees (rated by Supervisors)
Prepares responses to contractor time extension requests.[1]	2	4	4		OJT	
Maintains construction section inventory records.[1]	2	4	3		OJT	
Communicates construction record requirements to field personnel.[1]	3	4	5		OJT	
Accesses Central Office Computers to provide purchase order and change order status to field personnel.	4.3	4.3	4.3		OJT	
Answers telephone inquiries re. construction projects from public.	3.8	4.6	4.3		OJT, NT	
Works closely with contractors in the monitoring of all phases of construction.	4.5	5	4.7	4	OJT, NT	FT & OJT
Supervises other construction inspectors and other personnel assigned to project.	4.2[2]	4.7[3]	4.2[2]	4	OJT, NT	OJT
Interprets plans, specifications and construction methods for department personnel and contractors.	4.7	5	5	4	OJT, NT	FT & OJT

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b]	Type of training received for duty[c]	
					Received in the last two years (rated by incumbents)	Available to Employees (rated by Supervisors)
Supervises construction engineering layout work.	4	5	5	4	OJT,NT	FT & OJT
Recommends project staffing requirements.	3.7[2]	4.5	3.5[2]	4	OJT, NT	NT
Supervises sampling, testing and inspection of materials on the jobsite and ensures compliance with specifications.	4.5	4.5	4	4	OJT, NT	FT & OJT
Supervises all construction processes on the assigned project.	5	5	4.2	4	OJT, NT	FT & OJT
Recommends revisions to existing plans, specifications, and special provisions as dictated by field or unforeseen circumstances.	4.2[2]	4.7	4.7	4	OJT, NT	FT & OJT
Prepares progress and final estimates and other reports.	5	4.5	3.7	4	OJT, FT & OJT,NT	FT & OJT
Supervises and inspects execution and completion of utility and railroad agreements.	2.5	4.2	4.2	4	OJT,NT	FT & OJT

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job. Multiple entries on one line indicate disagreement as to training provided within a division or district.

[1]Performed only by one employee
[2]Difference of two scale points between respondents.

Responses
- Sixteen questionnaires were sent out. Five responses were received, including one from a supervisor.
- All responses were from districts.
- All incumbents have held their current positions for between two to five years.

Table 10: Job Inventory Survey for Environmental Scientist 3 (1 LS 3)
(All respondents are from Pre-Engineering Division)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b]	Type of Training Received for Duty[c]	
					Received in the last two years (rated by incumbents)	Available to Employees (rated by Supervisors)
Cooperation regarding Federal and State Environmental laws[1]	3	5	2		OJT	No response
Environmental Inspections of INDOT	3.5	2.5	3.5[2]	4[3]	OJT	OJT

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b]	Type of Training Received for Duty[c]	
					Received in the last two years (rated by incumbents)	Available to Employees (rated by Supervisors)
facilities						
Consultation for INDOT and others	3.5	4.5	3.5	4	OJT	OJT
Legal testimony	2	3.5[4]	4	3	NT	NT
Technical report writing	5	5	5	3	OJT	OJT
Interpreting legal environmental requirements	4.5	5	5	2[5]	OJT	OJT
Developing compliance plans	5	5	5	4	OJT	OJT

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Means were calculated on this basis.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job. Multiple entries on one line indicate disagreement as to training provided within a division or district. Multiple lines indicate differences between divisions and/or districts.
[1]Only the respondent reported that this duty was performed.
[2]The supervisor notes additionally that while general environmental inspections are done well, specific environmental inspections of hazardous waste are not done well at all.
[3]The supervisor feels that environmental inspections and consultation for INDOT and other agencies required more skill than the employee feels they do.
[4]The incumbent sees the provision of legal testimony as relatively unimportant whereas the supervisor sees it as extremely important
[5]In general, the supervisor believed that job incumbents perform their duty well, except for their ability to interpret legal environmental requirements.

Responses
- Eight questionnaires were sent out to Environmental Scientists and their supervisors. Two responses were received: one from an incumbent, and one from a supervisor.
- Both respondents work in divisions.
- The incumbent has held his/her current position for more than two years.

Table 11: Job Inventory Survey for Information Specialist 3 (2 LA 3)
(Respondents are from Public Affairs Division)

Duty Performed	Frequency of	Importance of	Skill required to	Overall	Type of training received for duty[c]

					Received in the last two years (rated by incumbents)	Available to Employees (rated by supervisors)
Researches newspapers, and other media to find information that is of interest to the staff and the agency and catalogues this information for future use.	4[1]	4[1]	3	5	OJT	NT
Develops news stories about individuals, activities and programs for employee newsletter and for news releases outside the agency.	3[1]	4.5	4.5	5	OJT	NT
Arranges for television coverage including interview of employees and guest appearances on scheduled programs.	2.5	5	3	5	OJT	NT
Maintains personal contact with representatives of the mass media, including newspaper, radio, and television stations in a public relations role.	4[1]	4[1]	3	5	OJT	NT
Video-tapes educational material for and about the agency meetings, conferences, and special events.	2	2	3	5	NT	NT
Provides consultant services to department staff in preparation of printed matter, also forms and certificates.	2.5	3	3	5	OJT	NT

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 3]	Type of training received for duty[c]	
					Received in the last two years (rated by incumbents)	Available to Employees (rated by supervisors)
Writes special topic reports for various publications, division director, or other departments.	2	2	4	5	NT	NT
Writes correspondence for agency's commissioner.	5	5	5		FT & OJT	FT & OJT
Prepares responses for governor O'Bannon's office on transportation matters.	5	5	5		FT & OJT	FT & OJT
Special event coordinator.	3	4	4		OJT	
Generates and maintains internet web pages.	3	5	5	4	FT	FT

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job. Multiple entries on one line indicate disagreement as to training provided within a division or district. Multiple lines indicate differences between divisions and/or districts.
[1]Difference of two scale points between respondents.
[3]Duties that supervisor did not rate the performance of are those that s/he listed as not being performed at all.

Responses
- Four questionnaires were sent out. Two responses were received, including one from a supervisor.
- Both respondents were from divisions.
- Incumbent has held his/her current position for between two and five years.

Table 12: Job Inventory Survey for Art Illustrator 5 (2 LG 5).
(Respondent is from Graphics Engineering)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty in the last two years[c] (rated by incumbents)
Provides illustrations and charts for agency publications.	5	5	5		NT
Provides layout and finished art for exhibit and promotional materials such as photographs, posters and pamphlets, utilizing skills in photography and silk screenings.	5	5	5		NT
Handletters agency award letters, certificates, signs and commemorative documents.	5	5	5		NT
Operates still cameras in collecting photographic material at a variety of agency activities, including public service programs.	4	5	5		NT
Trains employees in new procedures, and sets up programs for the training of new employees.	5	5	5		NT
Researches and makes recommendations on intra-agency investigations conducted on an administrative level.	4	4	3		NT

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.

[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job.
[1]No responses were received from supervisors.

Responses

- Four questionnaires were sent out. One response was received.
- Respondent was from a division.
- Incumbent has held his/her current position for more than five years.

Table 13: Job Inventory Survey for Personnel Officer 1 (2 NB 1)
(one respondent from HR division)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b]	Type of training available to employees[c] (rated by supervisors)
Provides overall supervision to staff, to include such duties as planning, organizing and reviewing work.	5	5	5	5	FT & OJT
Provides guidance and direction to the department regarding compensation/employment issues.	4	4	4	4	FT & OJT
Develops immediate long and short range goals, objectives and plans for the compensation/employment section.	3	3	4	4	OJT
Develops internal policies and facilitates the accomplishments of such.	4	4	5	4	OJT
Manages and reviews the hiring process.	4	4	4	4	FT & OJT
Manages and approves all job bank functions.	5	4	4	4	OJT
Coordinates department's personnel planning.	3	3	3	5	OJT
Administers records management functions.	5	5	3	3	OJT

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b]	Type of training available to employees[c] (rated by supervisors)
Administers the department's Performance Appraisal System.	3	3	3	3	OJT
Manages wage and salary programs.	5	5	5	5	FT & OJT
Coordinates the department's job analysis program.	3	3	3	4	FT & OJT
Participates in management meetings as an agency human resource expert.	2	2	4	3	OJT
Ensures compliance with policies, procedures, laws, rules and regulations.	3	4	3	3	OJT
Monitors new developments regarding changes in laws and policies.	2	2	2	2	FT & OJT
Counsels, disciplines, and conducts performance appraisal reviews for subordinates.	3	3	4	3	FT & OJT

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job.

Responses

- Four questionnaires were sent out. One response was received from a supervisor.
- Respondent is from a division.

Table 14: Job Inventory Survey for Personnel Officer 3 (2 NB 3)
(both respondents are from the HR division)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b]	Type of training received for duty[c]	
					Received in the last two years (rated by incumbnents)	Available to employees (rated by supervisors)
Assists in coordinating the work of the clerical staff in the completion of all paperwork related to the personnel functions.	3	3	3.5	5	OJT	OJT
Assists in handling all problems and questions related to personnel including answering questions and interpreting rules and regulations.	5	5	5	4	OJT	FT & OJT
Assists in recruiting, selecting, developing, and maintaining the best possible staff through interviewing, testing, assisting in training, maintaining good communications, and making recommendations on the disciplining of employees.	3[1]	5	4[1]	4	OJT	OJT
Develops and revises forms and procedures to best carry out personnel functions.	2.5	3[1]	3[1]	3	OJT	OJT

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b]	Type of training received for duty[c]	
					Received in the last two years (rated by incumbnents)	Available to employees (rated by supervisors)
Analyzes and factors job position reclassification.	2.5	5	5	4	FT & OJT	FT & OJT
Creates various compensation requests/packages to be approved by State personnel..	45	4.5	4.5	4	OJT	FT & OJT
Listing job openings.	4	4	3		OJT	

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job. Multiple entries on one line indicate disagreement as to training provided within a division or district.
[1] Difference of two scale points between respondents.

Responses
- Four questionnaires were sent out. Two responses were received, including one from a supervisor.
- Both respondents are from divisions.
- No data is available on the length of the incumbent's tenure.

Table 15: Job Inventory Survey for Accountant 2 (2 RA 2)
(Respondent is from Accounting and Control)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty in the last two years[c] (rated by incumbents)
Advises the controller or supervisor on the status of assigned accounts.	5	5	4		OJT
Assists in the development of general policies for a fiscal program.	4	5	4		OJT
Prepares or supervises the preparation of accounting records and financial reports and statements.	5	5	5		OJT
Assists management in the preparation of agency or program area budget requests.	4	4	4		OJT
Reconciles complex discrepancies between accounts and notifies the appropriate department of supervisor of errors.	4	5	4		OJT
Prepares reports for reconciliation of grant funded accounts.	3	4	4		OJT
Analyzes and interprets	5	5	5		OJT

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty in the last two years[c] (rated by incumbents)
financial statements and reports.					
Serves as liaison between agency and the federal government or other funding source for assigned account	4	4	4		OJT
Coordinates computerized accounting system within assigned area.	4	4	4		OJT
Certifies the accuracy of financial records and accounts.	4	5	5		OJT
Directs the work of lower level accountants and account clerks assisting in complex or unusual situations.	4	5	4		OJT
Interacts with state and federal auditors.	3	4	3		OJT

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job.
[1]No responses were received from supervisors.

Responses
- Five questionnaires were sent out. One response was received.
- Respondent was from a division.
- Incumbent has held his/her current position for between two years and five years.

Table 16: Job Inventory Survey for Accountant 3 (2RA3)
(respondent is from Accounting and Control)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty in the last two years[c]
Advises supervisor of the status of all accounts.	5	5	5		FT & OJT
Develops and recommends implementation of new accounting methods and procedures pertaining to the incumbent's area of responsibility.	4	5	5		FT & OJT
Assists in the development and maintenance of general policies for a fiscal program.	5	5	5		FT & OJT
Prepares accounting and financial reports and statements.	5	5	5		FT & OJT
Certifies the accuracy of financial records and accounts.	5	5	5		FT & OJT
Reconciles complex discrepancies between accounts.	5	5	5		FT & OJT

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty in the last two years[c]
Interacts with and responds to state and federal audit representatives.	3	4	4		NT

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job.
[1]No responses were received from supervisors.

Responses

- Four questionnaires were sent out. One response was received.
- Respondent was from a division.
- Incumbent has held his/her position for less than six months.

Table 17: Job Inventory Survey for Accountant 6 (2RA6)
(Respondent is from Accounting and Control)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty in the last two years[c] (rated by incumbents)
Posts transactions to appropriate ledgers and accounts.	5	5	3		FT & OJT
Verifies accuracy of all financial documents and records.	5	5	3		OJT
Reconciles accounts and subsidiary ledger transmissions with the general ledgers.	4	5	3		OJT
Recommends changes in accounting policy and assists in developing accounting procedures.	2	2	2		NT

Note.

[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job.
[1]No responses were received from supervisors.

Responses
- Five questionnaires were sent out. One response was received.
- Respondent is from a division.
- No data is available on the length of the incumbent's tenure.

Table 18: Job Inventory Survey for Developmental Specialist 1 (2 SA 1)
(respondent is from Division of Planning)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b]	Type of training available to employees[c] (rated by supervisors)
Analyzes effect of projects on areas using cost/benefit and input/output analysis submitting information to local governments and state highway department.	2.5	3	4	2	NT
Reviews projects for fulfillment of federal guidelines.	4[1]	5	3	3	FT & OJT
Performs project planning evaluating environmental, economic, and social impacts of proposals for a regional area frequently working in cooperation with local planning committees.	4	4	4	3	FT & OJT

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b]	Type of training available to employees[c] (rated by supervisors)
Evaluates impacts of alternative projects examining design estimates and applying highway engineering, economic, and environmental analysis.	2.5	3[1]	3.5	2	NT
Researches new projects and analysis techniques.	4	3.5	3.5	3	OJT
Reports findings to supervision, State Highway Commission, and local government.	4.5	4.5	3.5	3	NT
Travel demand modeling and highway economic resource system (HERS). [2]	3	3	5	4	FT & OJT
Project programming and tracking. [2]	4	5	2	3	OJT
Special program administration . [2]	4	3	3	3	NT
Major investment studies and corridor feasibility studies. [2]	3	3	4	3	FT & OJT
Long-range planning: public involvement, needs assessment, and technical analysis. [2]	4	5	4	3	FT & OJT

Note.

[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job.
[1] Difference of two scale points between respondents.
[2]Rated by supervisor only.

Responses
- Six questionnaires were sent out. Two responses were received, including one from a supervisor.
- Both respondents are from divisions.
- No data is available on the length of the incumbent's tenure.

Table 19: Job Inventory Survey for Appraiser 2 and 3 (2TT 2 and 3)
(Respondents are in Land Acquisition Section)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b] [4]	Type of training received for duty[c]
Prepares Right-of-Way Cost Estimates. [1]	3	5	4		NT
Prepares weekly progress reports. [1]	5	5	2		NT
When performing as a review appraiser, maintains Project status records.	5	5	3		NT
Attends preliminary and final field checks with the Division of Design for major projects.	3.5	5	4		NT
Appears as an expert witness for the State for	3[2]	5	5		OJT

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b] [4]	Type of training received for duty[c]
condemnation trials when necessary.					
Establishes Economic Rent for the Relocation Section as requested.	2	3	4		NT
Prepares appraisal reports for excess property to be disposed of by the Indiana Department of Transportation.	2	2	3		OJT
Prepares appraisals for project.	4.5	5	4		NT
Manages progress and coordination of appraisers on project. [3]	4	5	5		NT
Reviews appraisal report prepared by appraiser. [3]	5	5	5		OJT
Maintains consistent values for parcel to parcel and appraiser to appraiser.	5	5	5		OJT

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job.
[1]Rated by Appraiser 3 only.
[2] Difference of two scale points between respondents.
[3]Rated by Appraiser 2 only.
[4]No responses were received by supervisors.

Responses
- Twelve questionnaires were sent out. Two responses were received.
- Respondents were from divisions.

- Data is not available on the Length of tenure of incumbents.

Table 20: Job Inventory Survey for Program Coordinator 3 (2 WM 3)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty[c]		Location
					Received in the last two years (reported by incumbents)	Available to employees (reported by supervisors)	
Prepares reports on special activities.	4.6	5	4.5	5	OJT OJT NT	OJT FT & OJT	Ft. Wayne -Intermodal -O.S.
Devises plan of operation for implementing program.	5	5	5	5	OJT OJT	OJT FT & OJT	-Intermodal -Ft. Wayne -O.S.
Coordinates the activities of specialized projects with the program.	5	5	5	5	OJT	OJT NT	Ft. Wayne -O.S.

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty[c]		Location
					Received in the last two years (reported by incumbents)	Available to employees (reported by supervisors)	
Develops and evaluates proposals involving specialized personnel, special equipment and supplies, or special casts.	4.5	5	5	5	OJT	OJT FT & OJT	-Ft. Wayne -O.S.
Establishes, reviews, and updates agency policies and procedures related to program.	4	4.5	5	5	OJT	OJT FT & OJT FT & OJT	-Ft. Wayne -Intermodal O.S.
Reviews special project activities.	4.5	5	5	5	OJT	OJT FT & OJT FT & OJT	-Ft. Wayne -Intermodal -O.S.
Assists in budget preparations.	4	4.3	4	4.5	NT	NT FT, FT & OJT	-Ft. Wayne -O.S.
Answers technical questions relating to programs.	5	4.6	5	5	OJT NT	OJT FT & OJT	-Ft. Wayne -Intermodal -O.S.
Acts as helpdesk for computer software.	5	5	5		NT		-Intermodal
Analyzes data.	5	5	5		NT		-Intermodal
Acts as training committee chair.	3	3	3		NT		-Intermodal
Develops graphs and spreadsheets.	5	5	5		NT		-Intermodal
Works with New Computer SoFTware.	5	5	5		NT		-Intermodal

Note.

[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job. Multiple lines indicate differences between divisions and/or districts.
[2] Duties that supervisors did not rate the performance of are those that they listed as not being performed at all.

Responses
- Eight questionnaires were sent out. Eight responses were received, including two from supervisors.
- Four Responses were from districts, and four were from divisions.
- Four incumbents have held their current position for between two to five years. Two have held their current position for more than five years.

Table 21: Job Inventory Survey for Program Coordinator 4 (2 WM4)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty[c]		Location
					Received in the last two years (rated by incumbents)	Available to employees (rated by supervisors)	
Reviews applications for funding submitted by local or special interest groups, or other agencies for compliance with rules and regulations set forth by the program.	5	5	5		OJT		-Ft. Wayne
Furnishes and collects information on specific aspects of the program, such as procedure, needs	5	5	5		OJT		-Ft. Wayne

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty[c]		Location
					Received in the last two years (rated by incumbents)	Available to employees (rated by supervisors)	
and policies.							
Follows up on contracted EEO requirements.	5	5	5		OJT		-Ft. Wayne
Conducts specified analyses and investigations into certain areas such as long-range and short term goals, problems and complaints and disbursement of funds.	3	5	5		OJT		-Ft. Wayne
Assists in the preparation of Federal reports, developing training programs.	5	5	5		OJT		-Ft. Wayne
Evaluating trainees on the job.	5	5	3		OJT		-Ft. Wayne
Reviewing contractor's training program for trainee, if appropriate.	5	5	4		OJT		-Ft. Wayne
Onsite verification of documentation of DBEs payrolls, minority compliance, etc.	5	5	4		OJT		-Ft. Wayne
Monitors job sites of contractors holding Federal aid construction contracts or subcontracts, ensuring no discrimination is performed against	5	5	5		OJT		-Ft. Wayne

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty[c]		Location
					Received in the last two years (rated by incumbents)	Available to employees (rated by supervisors)	
employees.							

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job.
[1]No responses were received from supervisors.

Responses
- Six questionnaires were sent out. One response was received.
- Respondent was from a district.
- Incumbent has held current position for between two and five years.

Table 22: Job Inventory Survey for Program Coordinator 5 (2WM 5)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 2]	Type of training received for duty[c]		Location
					Received in the last two years (rated by incumbents)	Available to employees (rated by supervisors)	
Researches and compiles information relative to the assigned program area.	4	4.3	4.3	4	FT & OJT	OJT	-Ft . Wayne

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b] [2]	Type of training received for duty[c]		Location
					Received in the last two years (rated by incumbents)	Available to employees (rated by supervisors)	
Establishes and maintains biographical and historical files related to the program.	4.6	5	4	4		OJT	-Ft . Wayne
Coordinates correspondence for information requests.	5	4.3	3.6	4	OJT	OJT	-Ft . Wayne
Assists supervisor in the development and planning of overall program and its role in the functioning of the agency.	4[1]	4[1]	4.3	3	FT & OJT	OJT	-Ft . Wayne
Coordinates all health equipment, liability, workers compensation and third party claims.	3	5	4		FT		-Ft . Wayne
New Employee orientation.	3	5	4		OJT		-Ft . Wayne

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job. Multiple entries on one line indicate disagreement as to training provided within a division or district.
[1] Difference of three scale points between incumbents.

Responses
- Five questionnaires were sent out. Three responses were received.
- All respondents are from districts.
- One incumbent has held his/her current position for between two and five years. Data is not available for the other incumbent.

Table 23: Job Inventory Survey for Subdistrict Manager (2 WQ 2)

Duty Performed	Frequency of	Importance of	Skill required to	Overall	Type of training received for duty[c]	Location

					Received in the last two years (rated by incumbents)	Available to employees (rated by supervisors)	
Planning, directing, and coordinating the work of 70-100 subdistrict employees.	4.2[1]	4.4[2]	4.4[2]	3.5	NT FT & OJT OJT, FT & OJT	FT & OJT	-Ft. Wayne -Vincennes -LaPorte
Ensuring that unit foremen are adequately identifying defects and providing adequate checks of all roadway features within the responsibility of their units.	4.2[2]	4.2[2]	4[2]	3.5	NT FT & OJT OJT	FT & OJT	-Ft. Wayne -Vincennes -LaPorte
Developing and analyzing subdistrict schedules that access priorities between units and reflect the priorities of the District and Department.	4.2[2]	4.4[2]	4[2]	3	NT FT & OJT OJT, FT & OJT	FT & OJT	-Ft. Wayne -Vincennes -LaPorte
Submitting an annual work program that accurately identifies the road needs, to include identifying large projects, making good projection of material requirements, and needs for rotated or rental equipment.	3.6[1]	4.2[2]	4.4[2]	3	NT OJT OJT	FT & OJT	-Ft. Wayne -Vincennes -LaPorte
Planning annual workload and determining resource requirements based upon that plan.	3.6[2]	4.4	4.2[2]	4	NT OJT OJT, FT & OJT	FT & OJT	-Ft. Wayne -Vincennes -LaPorte
Ensuring that equipment and materials required for	3.8[2]	4.2[2]	4[2]	4	NT FT & OJT		-Ft. Wayne -Vincennes

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b]	Type of training received for duty[c]		Location
					Received in the last two years (rated by incumbents)	Available to employees (rated by supervisors)	
implementing the annual work program are requisitioned or requested with sufficient leadtime to be available when needed.					OJT	FT & OJT	-LaPorte
Investigating and taking corrective action on complaints and information requests from the general public.	4.8	4.6	4.6	4.5	NT OJT OJT	 FT & OJT	-Ft. Wayne -Vincennes -LaPorte
Providing personal supervision of personnel and equipment during emergencies, such as snow and ice removal, detours, accidents, and road repairs, etc.	4.2[2]	4.6	4.4[2]	5	NT OJT OJT	 FT & OJT	-Ft. Wayne -Vincennes -LaPorte
Initiating, through Permit Inspector, requests for permits, driveways, overweight and cut permits, etc.	3.6[2]	3.6[2]	3.6[2]	3	NT OJT	 FT & OJT	-Ft. Wayne -LaPorte
Enforcing, through subordinate staff, administrative policies and procedures.	4.2[2]	4.4	4.2[2]	4	NT FT & OJT OJT, FT & OJT	 FT & OJT	-Ft. Wayne -Vincennes -LaPorte
Preparing written requests concerning the future needs of the subdistrict, such as personnel, equipment, and supplies.	3.2[2]	4[2]	4[2]	4	OJT OJT OJT, FT & OJT	 FT & OJT	-Ft. Wayne -Vincennes -LaPorte

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b]	Type of training received for duty[c]		Location
					Received in the last two years (rated by incumbents)	Available to employees (rated by supervisors)	
Performing various personnel functions, such as conducting annual job evaluations, counseling and disciplining employees, selection of prospective employees, etc.	4.6	4.6	4.4[2]	4	OJT FT & OJT OJT, FT & OJT	FT & OJT	-Ft. Wayne -Vincennes -LaPorte
Coordinating subdistrict activities with other district functions, such as Traffic, Construction and Development.	3[2]	3.6[2]	3.4[2]	4	OJT FT & OJT OJT	FT & OJT	-Ft. Wayne -Vincennes -LaPorte
Recommending manpower budgets for subordinate organization units.	3.2[2]	3[1]	3.5[1]	4	OJT FT & OJT OJT	FT & OJT	-Ft. Wayne -Vincennes -LaPorte
Ensuring that new members are well trained and safety conscious.	4.4[2]	4.6	4.6	4	OJT FT & OJT OJT	FT & OJT	-Ft. Wayne -Vincennes -LaPorte

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job. Multiple entries on one line indicate disagreement as to training provided within a division or district. Multiple lines indicate differences between divisions and/or districts.
[1]Difference of three scale points between respondents.
[2]Difference of two scale points between respondents.

Responses
- Eight questionnaires were sent out. Five responses were received, including one from a supervisor.
- All respondents are from districts.

- Three incumbents have held their current positions for between two and five years. One respondent has held his/her position for more than five years.

Table 24: Job Inventory Survey for Draftsman 2 and 3 (3 AA 2 and 3)
(Respondents are from Graphics Engineering)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty in the last two years[c] (rated by incumbents)
Makes copies of maps, charts, etc.	3	4	4		OJT
Draws county and city road inventory maps in CADD system connecting road data to drawing.	5	5	5		OJT, FT & OJT
Interprets survey notes, road inventory notes, topographical maps, aerial photos for proper alignment of streets, roads, bridges, cultural features, fish and wildlife areas, park and recreational areas, city, state and county boundaries.	5	5	5		FT & OJT
Scans photos for use in graphic illustrations for other agencies as well as INDOT.	3	5	5		OJT
Dry mounts photos, posters, graphics for various agencies.	3	5	5		OJT

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).

[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job.
[1] No responses were received from supervisors.

Responses
- Five questionnaires were sent out.. Two responses were received.
- Respondents are from divisions.
- Incumbent have held their current positions for between seven months to two years.

Table 25: Job Inventory Survey for Engineering Assistant 1 (3 AB 1)

Duty Performed[1]	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 6]	Type of training received for duty[c]		Location
					Received in last two years (reported by incumbents)	Available to employees (reported by supervisors)	
Testing materials[2]	4.3[4]	4.5	4.1	4.5[5]	FT FT & OJT FT & OJT	OJT FT & OJT	-Ft. Wayne -Vincennes -LaPorte, -Research, - Roadway Mgmt
Auditing[3]	5	5	4		FT & OJT FT & OJT FT & OJT		-LaPorte -Roadway Mgmt, -Ft. Wayne
Rig Operation[3]	5	5	5		OJT		-Roadway Mgmt
Planning[3]	5	5	5		OJT		-Research
Field sampling	3.9	4.4	4.1	4[4]	OJT FT & OJT NT	OJT	-Vincennes , -Ft. Wayne -LaPorte -Roadway Mgmt
Boring[3]	5	5	5		OJT		- Roadway Mgmt
Supervising (crew/work activity)	3.5	4.5	4	4[5]	OJT FT & OJT NT	FT & OJT	- Roadway Mgmt -Vincennes, -LaPorte -Ft. Wayne
Project Coordination[3]	5	5	5		OJT OJT		-Research, -Roadway Mgmt
Documentation of work	4.2	4.2[4]	4.2	3		OJT	-Vincennes,

Duty Performed[1]	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 6]	Type of training received for duty[c]		Location
					Received in last two years (reported by incumbents)	Available to employees (reported by supervisors)	
procedures, records, inventories					OJT OJT		-Research, -Roadway Mgmt, -Ft. Wayne
Elementary Surveying[3]	4	5	5		FT & OJT		-LaPorte, Vincennes, Ft. Wayne, Roadway Mgmt
Collection of field data[3]	5	5	5	4	OJT OJT	OJT	-Vincennes, -Ft. Wayne, -Roadway Mgmt
Supervising distribution of tools, technology, etc.	4[4]	4[4]	4.5		FT & OJT		- Research
Training[3]	4	4	3		OJT FT & OJT		-Ft. Wayne,
Approving tests of materials for use[3]	2	3	3		NT		- Research, Roadway Mgmt
Rating bridge load[3]	5	5	5		FT & OJT, OJT		-Ft. Wayne

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job. Multiple entries on one line indicate disagreement as to training provided within a division or district. Multiple lines indicate differences between divisions and/or districts.
[1]There was extensive disagreement as to the duties performed in this job. Duties that are performed most often, by 50% of the incumbents, are related to testing, supervision and documentation. Incumbents listed more duties performed on the job than did supervisors.
[2]Lab testing occurs in divisions and field testing occurs in districts.

[3]No supervisors listed this as a duty that incumbents perform.
[4] Difference of two scale points between respondents.
[5] Difference of three scale points between respondents.
[6] Duties that supervisors did not rate the performance of are those that they listed as not being performed at all.

Responses

- Thirty four questionnaires were sent out. Sixteen responses were received, including eight from supervisors.
- Ten respondents were in districts and six were in divisions.
- Two incumbents have worked in their current position for between seven months to two years. Two others have held their current position for between two to five years. Four incumbents have worked in their current position for more than five years.

Table26: Job Inventory Survey for Engineering Assistant 1 (3 AB 1): Design Division, Consultant Services Section

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty[c]
Prepares requests for plans, calculations and reports necessary for project development.	5	5	5		OJT
Tracks submittal due dates; follows up on past due submittals.	5	5	5		FT & OJT
Maintains computer log of all transmittals.	5	5	5		FT & OJT
Maintains project schedules and files.	5	5	5		FT & OJT
Generates reports from information found in the electronic log.	2	2	2		OJT
Reviews consultant invoice-vouchers for project progress.	5	5	5		FT & OJT
Evaluates consultant submissals on scheduling, procedures and cooperation.	5	5	5		FT & OJT

Note.

[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job.
[1]No responses were received from supervisors.

Responses
- Three questionnaires were sent out. One response was received.
- The incumbent has worked in his/her current position for between two to five years.

Table 27: Job Inventory Survey for Engineering Assistant 1 (3 AB 1) : Design Division, Traffic Section

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty[c]
Prepares traffic signal plans with some geometric improvements for state projects.	5	5	5		OJT
Applies traffic signal standards and presents INDOT policies and procedures on traffic signal plans.	5	5	5		OJT
Attends any pertinent meeting or field inspections with the engineers on preparing traffic signal project for letting.	5	5	5		OJT
Applies broad technical knowledge of CADD applications in the solution of engineering design and detailing quantity computation problems.	5	5	5		FT & OJT

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.

[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job.
[1]No responses were received from supervisors.

Responses
- Three questionnaires were sent out. One response was received.
- Incumbent has held his/her current position for between seven months to two years.

Table 28: Job Inventory Survey for Engineering Assistant 1 (3 AB 1) : Design Division, Engineering Services

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty[c]
Assists in compiling data about railroad grade crossings.	5	4	3		NT
Evaluates data as needed and recommends projects for inclusion in the Highway Improvement program.	3	4	5		OJT
Programs railroad grade crossing projects for Federal and/or State Funding.	3	4	3		NT
Sets up initial project schedule and prepares letter to railroad requesting information needed for project.	3	5	3		OJT
Performs on-site field inspection of railroad grade crossing projects.	4	5	5		OJT
Reviews information provided by Railroad and prepares agreements for	5	5	4		NT

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty[c]
proposed work.					
Assists districts in resolving any problems or questions during construction; provides periodic review and processing of progress payments during construction.	4	5	5		NT
Provides technical and administrative information concerning railroad grade crossing projects to other offices and agencies.	4	4	5		NT
Assists in maintaining records to track the progress of projects and payments.	5	5	3		NT
Prepares reports on status of projects, payments, balance of available funds, and any problems.	5	3	3		NT

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job.
[1]No responses were received from supervisors.

Responses
- Three questionnaires were sent out. One response was received.
- Incumbent has held his/her position for between two and five years.

Table 29: Job Inventory Survey for Field Investigator 3 (3KB3)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty[c] in the last two years (rated by incumbents)	Location
Collects data pertinent to traffic patterns and traffic volumes.	4.6	4.6	3.6		OJT, FT & OJT OJT	-Seymour -LaPorte
Prepares field reports and sketches for all traffic counts.	4.6	4.6	4		OJT, FT & OJT OJT	-LaPorte -Seymour
Recommends relocation of various traffic counter stations, based on variables such as traffic patterns, highway construction, roadside development, tampering, or vandalism.	4	3	3		OJT	-Seymour
Takes visual traffic counts and analyses of vehicular movements, such as lane changes, passing on right	4.6	4.6	3.6		OJT OJT	-Seymour -LaPorte

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b] [1]	Type of training received for duty[c] in the last two years (rated by incumbents)	Location
or leFT, and turning movements.						
Investigates pedestrian traffic, volume and movements in order to determine the need for crosswalks, speed limit changes, sign changes, new traffic signals, etc.	4.5	5	4.5		OJT OJT	-Seymour -LaPorte
Investigates railroad intersections in order to determine the need for warning signs and signals.[3]	2	3	5		NT NT	-Seymour -LaPorte
Investigates intersections and right-of-way accesses for visibility, sight distance, right hand turn on red, accessibility, and related hazards.	4.6	4.6	4		OJT OJT	-Seymour -LaPorte
May attend public hearings in which highway traffic planning or problems are discussed.	2.5	3.5[2]	3.5		NT OJT	-Seymour -LaPorte
Draws sketches of the locations which are being investigated, reflecting pertinent data.	3.6[3]	4.6	4.3		OJT, FT & OJT NT	-LaPorte -Seymour
May recommend changes in traffic control devices and regulations on basis of	4.6	4.3	4.3		OJT OJT	-Seymour -LaPorte

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b] [1]	Type of training received for duty[c] in the last two years (rated by incumbents)	Location
findings.						
Determines average speed of vehicles, using electrical timing devices or radar equipment.	4.3	4.3	3.6		OJT, FT & OJT	-LaPorte
Determines and analyzes accident data and recommends solutions to reduce accident frequency.[3]	5	5	5		OJT	-Seymour
Photographing problem areas, intersections, etc.	3	3	3		OJT OJT	-Seymour -LaPorte
Distance measuring intersections.	3	3	3		OJT OJT	-Seymour -LaPorte

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job. Multiple entries on one line indicate disagreement as to training provided within a division or district. Multiple lines indicate differences between divisions and/or districts.
[1] No responses were received from supervisors.
[2] Difference of three scale points between incumbents.
[3] Performed only by one incumbent.

Responses
- Eight questionnaires were sent out. Five responses were received.
- All respondents are from districts.
- All incumbents have held their current positions for between two and five years.

Table 30: Job Inventory Survey for Personnel Technician (3 LC3)
(respondent is in Human Resources Division)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b]	Type of training available to employees [c] (rated by supervisors)
Takes applications for new employees and administers tests as appropriate.	3	4	2	3	OJT
Interviews and screens new applicants for positions.	5	5	4	2	OJT
Types varied statistical reports and forms such as budget reports.	5	5	5	4	FT & OJT
Types final draFT and/or final copy of various materials involving varied terminology.	5	5	4	3	OJT
Types letters, forms, and	5	5	3	3	FT & OJT

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b]	Type of training available to employees [c] (rated by supervisors)
other assorted documents.					
Performs related clerical functions such as filing and copying documents.	5	5	3	3	OJT
Receives visitors and telephone calls, relays non-technical information.	5	5	3	3	OJT
Compiles personnel reports as required.	5	5	4	4	FT & OJT
Prepares master tapes of program cards or cassettes, setting controls, inserting programs and typing any necessary information.	5	5	5	4	FT & OJT

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job.

Responses
- Four questionnaires were sent out. One response was received from a supervisor.
- Respondent was from a division.

Table 31: Job Inventory Survey for Secretaries 3 and 4 (3 MB 3 and 3 MB 4)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b]	Types of Training received for duty[c]		Location
					Received in the last two years (rated by incumbents)	Available to Employees (rated by supervisors)	
Receiving visitors.	4.8	4.8	3.7	4.5	OJT FT & OJT NT	OJT OJT FT&OJT NT	-LaPorte, -Ft. Wayne, -Intermodal -Mat. & Tests -Land Acquisition
Organizing mail.	4.8	3.8	3	5	OJT FT & OJT NT	OJT OJT FT&OJT NT	-Ft. Wayne, -LaPorte I-ntermodal, -Materials and Tests Land Acquisition
Typing correspondence, minutes, reports.	3.5[1]	4[1]	3.7[2]	4.5	OJT FT & OJT NT	OJT OJT FT & OJT NT	- LaPorte -Ft. Wayne, -Land Acquisition -Intermodal, -Mat. & Tests

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b]	Types of Training received for duty[c]		Location
					Received in the last two years (rated by incumbents)	Available to Employees (rated by supervisors)	
Proofreading.	3.8	4.5	3.4	4.5	OJT FT & OJT	OJT Ft. Wayne FT & OJT	- LaPorte - Ft. Wayne -Intermodal -Mat. & Tests
Develops and Maintains filing system.	4.5[2]	4.4	3.9	5	FT & OJT NT FT & OJT	FT &OJT OJT	-LaPorte, -Ft. Wayne - Intermodal, -Materials and Tests, -Land Acquisition
Compiles/collates data and research.	3.5[2]	4.2[1]	4[2]	5	OJT FT & OJT NT	OJT OJT FT & OJT	-Ft. Wayne, LaPorte - Land Acquisition -Materials and Tests
Maintains appointments.	3	3	3		NT NT NT NT NT		-LaPorte -Ft. Wayne -Land Acquisition -Mat. & Tests -Intermodal
Prepares administrative documents re. Vendors, payments, registrations.	4.7	4.2[1]	3.4[2]	5	OJTNT FT & OJT	OJT	-Ft. Wayne -Materials and Tests

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job. Multiple lines indicate differences between divisions and/or districts.
[1] Difference of two scale points between respondents.
[2] Difference of three scale points between respondents.

Responses
- Nineteen questionnaires were sent out. Ten responses were received, including four from supervisors.

- Six respondents were from districts. Four were from divisions.
- Three incumbents have held their current positions for between two to five years. Data was not available for the other three incumbents.

Table 32: Job Inventory Survey for Account Clerk 3, 4 and 5 (3 JA 3, 4 and 5)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b]	Type of training received for duty[c]		Location
					Received in last two years (reported by incumbents)	Available to Employees (reported by supervisors)	
Maintains agency financial records, and is responsible for certifying their accuracy	5[1]	5	5	4.6	OJT	OJT	-Vincennes -FT. Wayne
Assists in preparation and control of agency budget	5	5	5	4	OJT	OJT	-Vincennes -FT. Wayne
Receives, deposits, distributes, and accounts for monies, securities or other valuables	3	5	4	4.3	OJT	OJT	-Vincennes -FT. Wayne
Authorizes payment of vouchers or prepares voucher for director's signature	4.3	5	5	5	OJT	OJT	-Vincennes -FT. Wayne
Writes checks, transmits	5	4.3	5	4.6	OJT		-Vincennes

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b]	Type of training received for duty[c]		Location
					Received in last two years (reported by incumbents)	Available to Employees (reported by supervisors)	
payments, audits transactions, posts and processes encumbrances and expenditures, and performs transactions utilizing the correct department forms and records as needed						OJT	-FT. Wayne
Checks requisitions for quality, quantity and price per Quantity Purchase Award contract	5	5	4.6	4.6	OJT	OJT	-Vincennes -FT. Wayne
Operates all types of office equipment and orders equipment and repairs	4	3.6	4	4.3	OJT	OJT	-Vincennes -FT. Wayne

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job.
[1] Difference of two scale points between respondents.

Responses
- Thirteen questionnaires were sent out. Nine responses were received, including three from supervisors.
- All respondents were from districts.
- All incumbents have held their current positions for between two to five years.

Table 33: Job Inventory Survey for Switchboard Operator 5 (3 OS 5)
(Respondent is from Toll Road Division)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty in the last two years[c] (rated by incumbents)
Checks telephone bill at the end of the month against the monthly log of incoming and outgoing calls	5	5	5		NT
Receives and transmits all district radio messages, including messages to and from seven sub-districts,	5	5	5		NT

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty in the last two years[c] (rated by incumbents)
and all district and sub-district mobiles					
Maintains a daily log of all radio transmissions	5	5	5		NT
Takes all emergency calls	5	5	5		NT
Direct calls to appropriate Mgr/Foreman	5	5	4		NT
Take traffic signal calls; call light technician; get stop signs up.	5	5	4		NT
Report weather problems to Operations Foreman; call out workers for snow removal	5	5	4		NT
Take AFTer Hours messages	5	3	3		NT

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job. Multiple entries on one line indicate disagreement as to training provided within a division or district. Multiple lines indicate differences between divisions and/or districts.
[1] No responses were received from supervisors.

Responses
- Five questionnaires were sent out. One response was received.
- No data was available on length of incumbent's tenure.

Table 34: Job Inventory Survey for Clerical Assistants 3, 4 and 5(3 LD 3, 4 and 5)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b]	Type of training received for duty[c] [1]		Location
					Received in the last two years (rated by incumbents)	Available to employees (rated by supervisors)	
Gathers data and compiles statistical reports as requested[2]	5	5	3.5	5	FT & OJT, NT	OJT OJT OJT	-Ft. Wayne -Vincennes -LaPorte

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b]	Type of training received for duty[c 1]		Location
					Received in the last two years (rated by incumbents)	Available to employees (rated by supervisors)	
					OJT OJT, FT & OJT		-Mat. & Tests -Operations
Answers technical questions and traces requested information	3.5	4.5	3.5	4	OJT, NT FT	OJT OJT OJT	-Ft. Wayne -Vincennes -LaPorte -Operations
Sorts, distributes, responds to and posts information to records, files, and other documents	4.2	4	3.4	4.3	FT & OJT, NT OJT, FT & OJT	OJT OJT OJT	-Ft. Wayne -Vincennes -LaPorte -Operations
Prepares reports using information obtained from the supervisor or source documents	4.5	4.2	4	4	OJT, NT FT & OJT	OJT OJT OJT	-Ft. Wayne -Vincennes -Mat. & Tests -Operations
Trains and coordinates the work of lower level clerks within the assigned area	3	3.5	3.5	3.5	NT	OJT	-Ft. Wayne
Proofreads, verifies accuracy, and makes other reviews for compliance with form, content, and procedures	4	3.8	4	2.6	NT OJT FT & OJT	OJT OJT OJT	-Ft. Wayne -Vincennes -LaPorte -Mat. & Tests -Operations
Answers inquiries over the telephone and in person concerning specialized area.	4.2	4.6	3.6	4	OJT, NT FT & OJT	OJT OJT OJT	-Ft. Wayne -Vincennes -Operations
Operates office machines related to specific area of work.	4.5	4.7	3.7	4	FT & OJT, NT	OJT NT	-Ft. Wayne -Vincennes -LaPorte

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b]	Type of training received for duty[c] [1]		Location
					Received in the last two years (rated by incumbents)	Available to employees (rated by supervisors)	
					FT & OJT		-Mat. & Tests
Receives correspondence, determines appropriate action, and composes replies	2.2	2.2	3.2	2.5	FT & OJT, NT OJT	OJT OJT	-Ft. Wayne -Vincennes -Mat. & Tests
Performs work-related oversize/ overweight permit issuance[2]	5	5	4	5	NT	OJT	-Ft. Wayne
Sorts permits applications and distributes work among co-workers[2]	5	5	2	4		OJT	-Operations
Co-ordinates with INDOT for route approval[2]	5	5	2	4		OJT	-Operations

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job. Multiple lines indicate differences between divisions and/or districts.
[1]Respondents who reported FT & OJT were in the districts.
[2]Restricted to Clerical Assistant 3.

Responses
- Twenty five questionnaires were sent out. Twelve responses were received, including five from supervisors.
- Five respondents were from divisions, and seven were from districts.
- One incumbent has held his/her current position for between two and five years. Three incumbents have held their current positions for over five years. Data was not available for three incumbents.

Table 35: Job Inventory Survey for Stores Clerk 3, 4 and 5 (3 PA 3, 4 and 5)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b]	Type of training received for duty[c]		Location
					Received in last two years (reported by incumbents)	Available to employees (reported by supervisors)	
Contacting Vendors for bids	3.7	4.5	4.5	4	OJT, FT & OJT	OJT OJT FT & OJT FT & OJT	-Ft. Wayne -Vincennes -Crawfordsville -Valparaiso
Organizing and verifying incoming materials	4.7	5	4.7	4.5	OJT, FT & OJT	FT & OJT OJT FT & OJT FT & OJT	-Ft. Wayne -Vincennes -Crawfordsville Valparaiso
Requisitioning material to fill stock	4.7	5	4.2	4	FT & OJT, NT	OJT OJT OJT FT & OJT	-Ft. Wayne -Vincennes -Crawfordsville -Valparaiso
Typing reports	4.7	5	4.3	4	OJT, FT & OJT, NT	FT & OJT OJT OJT FT & OJT	-Ft. Wayne -Vincennes Crawfordsville -Valparaiso
Purchasing for districts	5	5	4.7	4	OJT, FT & OJT	OJT OJT OJT FT & OJT	-Ft. Wayne -Vincennes -Crawfordsville Valparaiso
Preparing documents for data entry	5	5	4.7	4.5	FT & OJT	FT & OJT OJT NT FT & OJT	-Ft. Wayne -Vincennes -Crawfordsville Valparaiso

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).

[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job. Multiple lines indicate differences between divisions and/or districts.

Responses

- Twelve questionnaires were sent out. Five responses were received, including four from supervisors.
- All respondents were from districts.
- Incumbent has held his/her position for between two and five years.

Table 36: Job Inventory Survey for Maintenance Repair 2 and 3 (4IA2 and 3)

Duty Performed[1]	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b]	Type of training received for duty[c]		Location
					Received in the last two years (reported by incumbents)	Available to employees (reported by Supervisors)	
Makes routine and complex plumbing and electrical repairs.	4	5	3.6	4	OJT FT & OJT	OJT	-Toll Road -Ft. Wayne
Checks heating, furnaces, and maintenance equipment for efficiency and making necessary repairs.	3[3]	5	4	4	OJT OJT, FT & OJT	OJT	-Toll Road -Ft. Wayne
Installs and repairs new equipment or modifies existing installations following blueprints and manuals.	3	5	3.5	4	OJT FT & OJT	OJT	-Toll Road -Ft. Wayne
Installs and repairs wiring and conduit, plumbing fixtures and other related items.	3.5[3]	4.7	3.7	4	OJT FT & OJT	OJT	-Toll Road -Ft. Wayne
Makes decisions and recommendations that affect whether or not a private contracting service is warranted to repair or replace equipment.	4	4	4.5	4	OJT	OJT	-Toll Road
Prepares maintenance reports.[2]	3	4	3	4	OJT FT & OJT	OJT	-Toll Road -Ft. Wayne
Checks and repairs motors, pumps and	3	4.7	3.5	5	OJT NT, FT & OJT	OJT	-Toll Road -Ft. Wayne

Duty Performed[1]	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b]	Type of training received for duty[c]		Location
					Received in the last two years (reported by incumbents)	Available to employees (reported by Supervisors)	
thermostats.							
Performs as a skilled tradesperson on major projects as needed.	3.3	4.3	4.3	4	FT & OJT NT	OJT	-Toll Road -Ft. Wayne
Performs major maintenance repairs and directs assistants when necessary.	3.6	4.3	4.3	4	OJT NT	OJT	-Toll Road -Ft. Wayne
Trains new employees.	3	5	5	4	OJT	OJT	-Toll Road
Lab testing and operation of water, wastewater treatment plants.	3.5[3]	5	5	5	OJT	OJT	-Toll Road
Use of radio and office equipment.	4	4	4	4	OJT	OJT	-Toll Road
Keeps parts inventory.	3	4	3	4	OJT	OJT	-Toll Road
Operates equipment CDL required.	4	5	4	5	OJT	OJT	-Toll Road

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job. Multiple lines indicate differences between divisions and/or districts.
[1]All employees are from the same division/district.
[2]Rated by only one respondent.
[3] Difference of two scale points between respondents.

Responses
- Eleven questionnaires were sent out. Six responses were received, including one from a supervisor.
- All respondents were from a district.

- All incumbents have held their current positions for more than five years.

Table 37: Job Inventory Survey for Highway Maintenance Worker 2 and 3 (4 MB 2 and 3)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty[c]		Location
					Received in last two years (reported by incumbents)	Available to Employees (reported by supervisors)	
Roadside maintenance duties (mowing, trash, trimming, cleaning, drainage, etc).	5	4	4.4	4.2	NT	FT & OJT FT & OJT FT & OJT	-Ft. Wayne -LaPorte -Vincennes -Greenfield
Maintaining traffic control, flagging traffic, etc	5	4.6[1]	4	4.6	FT & OJT	FT & OJT FT OJT	-Ft. Wayne -LaPorte -Vincennes -Greenfield
Signage repair	5	5	5	5	FT & OJT, NT	FT & OJT	-Ft. Wayne -LaPorte
Operating mechanical equipment (snow removers, marking machines, etc).	4.6[1]	5	5	4.4	OJT, FT & OJT	FT & OJT FT & OJT FT & OJT	-Ft. Wayne -LaPorte -Vincennes -Greenfield
Prepares weekly and monthly performance reports and submits to supervisor for review.[2]	4.2	5	4.2	4.2	NT, OJT	FT & OJT FT & OJT OJT	-Ft. Wayne -LaPorte -Vincennes -Greenfield
Provides communication to the sub-district, assisting them on problems or questions. [2]	2.8[1]	4	3.6[1]	4.4	OJT	NT, FT & OJT OJT, FT & OJT FT & OJT	-Ft. Wayne -LaPorte -Vincennes -Greenfield

Note.

[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job. Multiple entries on one line indicate disagreement as to training provided within a division or district.
[1]No responses were received from supervisors.
[2]Restricted to Highway Maintenance Worker 2.

Responses

- Thirty six questionnaires were sent out. Thirteen responses were received, including eight from supervisors.
- All respondents were in districts.
- One incumbent has held his/her current position for between seven months and two years. Three incumbents have held their current positions for over five years.

Table 38: Job Inventory Survey for Highway Engineer S4 (6 DC 4)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 3]	Type of training received for duty[c]		Location
					Received in the last two years (reported by incumbents)	Available to employees (reported by supervisors)	
Directing and supervising staff to ensure conformance with policy practice.[1]	4.8	4.9	4.7	3.5		FT & OJT FT & OJT OJT	-LaPorte -Vincennes Ft. Wayne
Authorizing and approving the final check on construction progress and final estimates.	5	4.3	4.6	3.6		FT & OJT FT & OJT OJT	-LaPorte -Vincennes -Ft. Wayne
Coordinating District construction activities with police and fine officials to ensure traffic and fire safety.	4	5	3.6	4		FT & OJT FT & OJT OJT	-LaPorte -Vincennes -Ft. Wayne
Enforcing specifications and procedural requirements established by the Department.[1]	4.2	5	4.2	3.5		FT & OJT FT & OJT FT & OJT	-LaPorte -Vincennes -Ft. Wayne
Performing final staff review of construction change orders,	4.5	5	4.8	3.7		FT & OJT FT & OJT FT & OJT	-LaPorte -Vincennes -Ft. Wayne

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 3]	Type of training received for duty[c]		Location
					Received in the last two years (reported by incumbents)	Available to employees (reported by supervisors)	
supplemental work agreements, and changes in plans.							
Supervising the control and inspection of utility and railroad agreements.	4.3	4.3	4	4		FT & OJT FT & OJT FT & OJT	-LaPorte -Vincennes -Ft. Wayne
Arranging sufficient staff for projects.[1]	3.4	4.6	3.6	4		FT & OJT FT & OJT FT & OJT	-LaPorte -Vincennes -Ft. Wayne
Assigning projects to Area Engineers.	5	5	4.6	3.6		FT & OJT NT NT	-LaPorte -Vincennes Ft. Wayne
Making recommendations to the District Engineer/ Director concerning the application of design and construction plans and specifications.	4.4	5	4.8	3.7		FT & OJT NT FT & OJT	-LaPorte -Vincennes -Ft. Wayne
Keeping other District functions advised as to progress of construction as it concerns them.	4.2	5	4.6	4		FT & OJT NT FT & OJT	-LaPorte -Vincennes -Ft. Wayne
Providing for the training and development of employees.	4.2	4.2	4.4	3.7		FT & OJT NT FT & OJT	-LaPorte -Vincennes -Ft. Wayne
Prepares recommendations and needs regarding manpower and annual budget. [1]	4	4.8	4.4	3.6[3]	OJT	FT & OJT NT FT & OJT	-LaPorte -Vincennes -Ft. Wayne

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 3]	Type of training received for duty[c]		Location
					Received in the last two years (reported by incumbents)	Available to employees (reported by supervisors)	
Reviewing construction reports for accuracy and completeness.	4.6	5	4.6	3.6		FT & OJT NT FT & OJT	-LaPorte -Vincennes -Ft. Wayne
Providing for performance review and appraisal of subordinate and recommends personnel actions affecting subordinates.[1]	3.6[1]	4.4	4.1	2.7[3]	NT FT & OJT FT & OJT	FT & OJT FT & OJT OJT FT & OJT	-Tech Services -Roadway Mgmt -Ft. Wayne -Mat. & Tests -LaPorte -Vincennes
Delegating responsibility and authority to subordinates consistent with their duties and abilities.[1]	4.3	4.9	3.9	3.2[3]	NT FT & OJT OJT	OJT FT & OJT OJT FT & OJT	-Tech Services Mat. & Tests -Ft. Wayne -LaPorte -Vincennes
Directing the summarization of safety and congestion statistics.[2]	4	4	5		FT & OJT		-Roadway Mgmt
Participates in development and recommendation of policies and procedures.[2]	5	5	5		NT FT & OJT		-Tech Services -Mat. & Tests
Review and approval of pay/travel vouchers.	5	4	2		OJT		-Tech Services
Selection of and coordination with consultants.[2]	4	5	3		OJT		-Tech Services

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 3]	Type of training received for duty[c]		Location
					Received in the last two years (reported by incumbents)	Available to employees (reported by supervisors)	
Review, organize and prepare responses to legal inquests.[2]	3	3	3		OJT		-Tech Services
Attend manager's meetings.[2]	2	3	2		NT OJT		-Tech Services -Roadway Mgmt
Supervising geotechnical instrumentation, installation, monitoring programs for INDOT. [2]	4	5	4		FT & OJT		Mat. & Tests
Actively participate in research advisory committee.[2]	3	5	5		FT & OJT		Mat. & Tests
Coordination of consultant fieldwork.[2]	5	5	5		FT & OJT		Mat. & Tests
Oversee maintenance of field equipment.[2]	5	4.5	4.5		FT & OJT		Mat. & Tests

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job. Multiple entries on one line indicate disagreement as to training provided within a division or district. Multiple lines indicate differences between divisions and/or districts.
[1]Rated by all respondents
[2]Rated by respondents in Divisions.
[3]Duties that supervisors did not rate the performance of are those that they listed as not being performed at all.

Responses
- Eighteen questionnaires were sent out. Eleven responses were received
- Five respondents were in divisions. Six were in districts.

- Four incumbents have held their current position for between two to five years. Data was not available for seven incumbents.

Table 39: Job Inventory Survey for Highway Engineer S4 (6 DC 4): Design Division, Traffic Design Section

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty[c]
Directs and supervises subordinate positions.	4	5	4		NT
Supervises the design unit in processing of contract plans.	4	5	5		NT
Reviews preliminary plans.	3	4	4		NT
Reviews and updates final plans.	4	4	5		NT
Provides construction support by making construction changes.	2	3	4		NT
Establishes and approves priorities, goals and deadlines.	5	5	5		NT
Provides and directs	4	4	4		NT

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty[c]
familarization of all employees with rules, policies and procedures.					
Identifies employee training needs.	3	4	4		NT
Prepares performance appraisals.	4	3	4		NT
Examines and recommends personnel actions affecting employees.	2	4	4		NT
Interviews personnel for promotions and new hires.	4	5	5		NT
Prepares recommendations of personnel functions and transactions.	3	4	4		NT
Ensures that unit is adequately staffed and organized.	4	4	4		NT
Reviews, processes and distributes all correspondence received.	4	5	4		NT
Provides technical assistance to other divisions.	4	5	5		NT
Provides guidance and instruction to subordinates on complex design problems.	4	4	5		NT
Serves as expert witness	2	3	5		NT

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty[c]
in lawsuits filed against the state.					
Acts as traffic design section manager.	3	3	4		NT

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job.
[1]No responses were received from supervisors.

Responses
- One questionnaire was sent out. One response was received.
- Incumbent has held his/her position for more than five years.
-

Table 40: Job Inventory Survey for Highway Engineer S 4 (6 DC 4): Design Division, Bridge Rehabilitation Unit.

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty[c]
Directs and supervises subordinate positions.	5	5	5		FT & OJT
Participates in the recommendation and development of procedures governing the unit.	5	5	5		FT & OJT
Reviews preliminary plans.	2	3	3		OJT
Reviews and updates final plans.	2	3	3		OJT
Assigns projects to consultants.	5	5	5		OJT

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty[c]
Establishes and approves priorities, goals and deadlines.	5	5	5		FT & OJT
Provides and directs familarization of all employees with rules, policies and procedures.	4	5	5		FT & OJT
Coordinates and approves inspection reports.	5	5	5		OJT
Coordinates project design scheduling.	5	5	5		OJT
Prepares recommendations of personnel functions and transactions.	5	5	5		OJT
Ensures that unit is adequately staffed and organized.	5	5	5		OJT
Reviews, processes and distributes all correspondence received.	5	5	5		OJT
Provides review of unit's productions standards and directs the unit for assurance of production quality and quantity.	4	5	5		OJT

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job.

[1]No responses were received from supervisors.

Responses
- One questionnaire was sent out. One response was received.
- Incumbent has held his/her position for between two and five years.

Table 41: Job Inventory Survey for Highway Engineer S5 (6 DC 5)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty[c]		Location
					Received in the last two years (reported by incumbents)	Available to Employees (reported by supervisors)	
Scheduling and coordination of field activities to suit the needs of the Engineering and Laboratory Units.	2	3	3	4		OJT FT & OJT	-Ft. Wayne -LaPorte
Dispatching Field Unit personnel to maximize the work output.	5	5	3.3	4	NT FT & OJT	NT -FT & OJT	-Ft. Wayne -LaPorte -N.A.
Determining the necessity and extent of subsurface	3.3	4.6	4.6	4	OJT NT	OJT	-Ft. Wayne N.A.

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty[c]		Location
					Received in the last two years (reported by incumbents)	Available to Employees (reported by supervisors)	
investigations.							
Field checking project areas where subsurface investigation will be performed.	3	4	4	3	OJT NT	OJT FT & OJT	-Ft. Wayne -LaPorte N.A.
Assigning boring locations, depths, and sample types and number to be taken according to INDOT guidelines.	2	2	3		FT & OJT		N.A.
Overseeing that required periodic maintenance and emergency repairs are made in a timely manner on field unit equipment.	2	3	2		OJT		N.A.
Performing related administrative duties.	4.5	4	3.5	3	OJT		N.A.
Checks travel and salary vouchers.	3	3	2.5	2.5	OJT	OJT	Ft. Wayne
Assisting in the review of Open End Agreement and Consultant cost itemizations to approve quantities for payment.	3	3	3	4		OJT FT & OJT	-Ft. Wayne -LaPorte
Recommends most economical and practical solutions to construction problems.	3.5	54	43	4	 FT & OJT	FT & OJT FT & OJT	-Ft. Wayne -LaPorte N.A.
Trains construction	3.3	4.6	4.6	4		FT & OJT	-Ft. Wayne

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b] 1	Type of training received for duty[c]		Location
					Received in the last two years (reported by incumbents)	Available to Employees (reported by supervisors)	
personnel on the use of new technology in INDOT projects.					NT	FT & OJT	-LaPorte N.A.

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job.

Responses
- Ten questionnaires were sent out. Seven responses were received, including four from supervisors.
- Five respondents were in districts. Three were in divisions.
- Two incumbents had held their current positions for between two and five years. No data was available for one incumbent.

Table 42: Job Inventory Survey for Engineering Assistant S3 (8 AB 3)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b] 1 5	Type of training received for duty[c]		Location
					Received in the last two years (reported by incumbents)	Available to Employees (reported by supervisors)	

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1 5]	Type of training received for duty[c]		Location
					Received in the last two years (reported by incumbents)	Available to Employees (reported by supervisors)	
Supervision of work personnel, delegation and scheduling of projects, provision of assistance.	4.2	4.4	4.2	3.8	FT & OJT, NT OJT, FT & OJT	OJT, FT & OJT FT & OJT OJT	-Ft Wayne -Mat. & Tests -Vincennes
Supervision and testing of construction materials.	4.2[4]	4.6	4.4	3.5[4]	FT & OJT, NT OJT, FT & OJT	FT & OJT OJT OJT	-Ft. Wayne -Mat. & Tests -Vincennes
Verification of salary/ travel vouchers.	4.4	4.6	3.8[4]	4	OJT, NT NT	OJT FT & OJT OJT	-FT. Wayne -Mat & Tests -Vincennes
Working with contractors, INDOT divisions, districts and researchers in resolving scheduling problems.	4	4	3.8[4]	4	FT & OJT, NT OJT	OJT	-Ft. Wayne -Mat & Tests
Checking quality test records, verifying test reports.	4.3[4]	4.3	3.8	3.8[4]	FT & OJT, NT FT & OJT	OJT, NT	-Ft. Wayne -Mat. & Tests
Working with producers to resolve material/plant problems.[2]	3.7	4.2	4.2[4]	3.7[4]	FT & OJT, NT		
Monitoring operations to meet specification requirements.	4.2	4.5	4.5	4.5	FT & OJT OJT, FT & OJT	FT & OJT, NT FT & OJT -OJT	-Ft. Wayne -Mat. & Tests -Vincennes
Attending conferences.	3[4]	3.2[4]	2.5[4]	3	NT FT, NT	FT, NT OJT	-Ft. Wayne -Mat. & Tests -Vincennes
Performing construction	3.6[4]	4	3.6	4	NT	FT & OJT	-Ft. Wayne

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1 5]	Type of training received for duty[c]		Location
					Received in the last two years (reported by incumbents)	Available to Employees (reported by supervisors)	
engineering layout work in order to implement design plans.						OJT	-Vincennes
Operates test systems and performs research functions.	3.6[4]	4.2	3.6	4	OJT	NT OJT	-Ft. Wayne -Vincennes
Makes recommendations and revisions to existing plans as dictated by field circumstances.[2]	3	3	3	3.5	OJT FT & OJT	OJT OJT	-Ft. Wayne -Mat. & Tests -Vincennes
Responding to public, local officials as to construction status.[2]	4	4	3	4.5	OJT, NT	OJT	Ft. Wayne -Vincennes
Providing training and guidance to systems technicians.	4	4	4	3.5	FT & OJT	OJT	-Mat & Tests -Vincennes
Directing survey crews.[2]	3	4	4	4.5	NT	OJT	-Ft. Wayne -Vincennes
Working with division engineers to coordinate data collection.[3]	4.3	3.6	3.6		OJT, FT & OJT	NT OJT OJT	-Ft. Wayne -Mat & Tests -Vincennes
Serves as Senior Research technician; Supervises research technicians in the field.[3]	2.6[4]	3.6	3.6		FT & OJT		-Mat & Tests
Supervises upgrade/ maintenance/repair of test systems.[3]	2.6[4]	3[4]	3.3		OJT	NT OJT OJT	-Ft. Wayne -Mat & Tests -Vincennes

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1 5]	Type of training received for duty[c]		Location
					Received in the last two years (reported by incumbents)	Available to Employees (reported by supervisors)	
Reviews testing plans and activities in order to ensure agreement with specifications and plans.[3]	3	4	4		FT & OJT	NT OJT	-Ft. Wayne -Mat & Tests

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job. Multiple entries on one line indicate disagreement as to training provided within a division or district. Multiple lines indicate differences between divisions and/or districts.
[1]All supervisors are from the districts.
[2]Performed exclusively in districts.
[3]Performed exclusively in divisions.
[4] Difference of two scale points between respondents.
[5]Duties that supervisors did not rate the performance of are those that they listed as not being performed at all.

Responses
- Thirty questionnaires were sent out. Sixteen responses were received, including eight from supervisors.
- Four respondents were in divisions, and eleven were in districts.
- One incumbent has held his/her current position for less than seven months. Another has held his/her current position for between two years and five years. Three incumbents have held their current positions for more than five years. Data was not available for three respondents.

Table 43: Job Inventory Survey for Engineering Assistant S 3 (8 AB 3): Design Division, Plan Development Section.

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty[c]
Prepares preliminary and final road construction plans and right of way plans for minor projects.	5	4	5		NT
Ensures the technical adequacy and completeness of above plans.	5	4	5		NT
Utilizes the proper application of CADD techniques and standards to plot survey data and draw plan sheets.	2	2	4		NT
Coordinates the activities of draFTsmen in the Plan Development section.	5	5	5		NT
Selects appropriate roadway alignment, geometrics and standards for the design of structures and the associated roadway features of minor projects and computing quantities.	4	5	5		NT
Reviews/manages	4	5	5		NT

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty[c]
replacement projects and road projects developed by consultants.					

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job.
[1]No responses were received from supervisors.

Responses
- One questionnaire was sent out. One response was received.
- Incumbent has held his/her current position for more than five years.

Table 44: Job Inventory Survey for Electronics Technician (9 GA 4)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty[c]
Organizes shop and field workload and determines work distribution.	5	5	5		FT & OJT
Supervises subordinate technicians in the more complex electronic repairs.	3	5	5		FT & OJT
Arranges work schedule in order to meet emergency repairs of traffic signs/flashers.	5	5	5		FT & OJT
Oversees the preventative maintenance program and established target dates for routine maintenance on equipment.	5	5	5		FT & OJT
Coordinates specific projects with subdistricts, utilities, contractors and municipal or county agencies.	5	5	5		FT & OJT
Provides budgetary input to traffic engineer.	3	4	5		FT & OJT
Operates a variety of meters and test equipment in order to detect electrical difficulties.	4	4	4		FT & OJT

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 1]	Type of training received for duty[c]
Evaluates the work of subordinates theough the review of individual crew day cards as well as completion of annual performance appraisals.	5	5	5		FT & OJT
Counsels and resolves minor grievances and informal complaints; recommends disciplinary action when necessary.	4	5	5		FT & OJT

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job.
[1]No responses were received from supervisors.

Responses
- Four questionnaires were sent out. One response was received.
- Respondent is in a division.
- Incumbent has held his/her position for between two and five years.

Table 45: Job Inventory Survey for Highway Maintenance S 4 and S 5 (9MB4 and 9 MB 5)

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 2]	Type of training received for duty[c] Received in the last two years (rated by incumbents) Available to employees (rated by supervisors)	Location
Decides the most efficient utilization of personnel and equipment.	4.8	5	5		OJT, NT, FT & OJT	-Ft. Wayne
Assigns work to units.	5	5	5		OJT, NT, FT & OJT	-Ft. Wayne
Explains methods, procedures, scheduling and equipment.	4.4	4.2	4.4		OJT, NT, FT & OJT	-Ft. Wayne
Spot checks work being performed for methods, procedures and acceptable standards.	4.8	5	4.8		OJT, NT, FT & OJT	-Ft. Wayne
Inspects work upon completion.	4.6	4.8	4.6		OJT, NT, FT & OJT	-Ft. Wayne
Instructs unit foreman on new procedures regarding maintenance, flagging, management and safety.	4.3	4.6	4.6		OJT, FT & OJT	-Ft. Wayne
Makes sure subordinates know rules and policies.	4.2	4.6	4.2		OJT, FT & OJT, NT	-Ft. Wayne
Conducts annual job	4.2	5	5		OJT, FT & OJT	-Ft. Wayne

Duty Performed	Frequency of performance of duty[a]	Importance of duty to job[a]	Skill required to perform duty[a]	Overall performance of employees[b 2]	Type of training received for duty[c] Received in the last two years (rated by incumbents) Available to employees (rated by supervisors)	Location
evaluation.						
Purchases materials and supplies.	5	5	4		OJT, FT & OJT	-Ft. Wayne
Maintains inventory.	5	5	4.5		OJT	-Ft. Wayne
Projects and monitors annual budget.	4	5	4.5		OJT	-Ft. Wayne

Note.
[a]Frequency, Importance and Skill were measured using 5-point scales (1= never, 5= often; 1=unimportant, 5= important; 1= little to no skill, 5= a great deal of skill). Figures reported are means.
[b]The overall performance of employees was rated by supervisors only (1= poor, 5= excellent).
[c]FT= Formal Training; OJT= On the Job Training; FT & OJT= Both Formal Training and On the Job training; NT = no training; duty is a prerequisite for the job. Multiple entries on one line indicate disagreement as to training provided within a division or district. Multiple lines indicate differences between divisions and/or districts.

Responses
- FiFTeen questionnaires were sent out. Five responses were received.
- All respondents were in districts.
- Two incumbents have held their current positions for between two and five years. Three incumbents have held their current positions for more than five years.

Job Classification	Job Performance	# of Responses	Training Needs	Training Provided	Notes
Highway Engineer 1 (1 DC 1)	3.4	1			
			Coordinates division activities with other State agencies as well as out-of-state, Federal and local agencies sharing jurisdiction.	OJT	Orientation Session
			Supervises, directs and evaluates section engineers and support staff.	OJT	Orientation Session
Highway Engineer 2 (1 DC 2)	3.2	3			
			Elaborates new standard documents and creates new standard drawings in English and metric units. Writes standard specifications, new design procedure and field instructions.	OJT	Formal Training needed

NT - No Training
FT - Formal training

OJT - On-the-job Training

Job Classification	Job Performance	# of Responses	Training Needs	Training Provided	Notes
			Revises standard documents due to new industry requirements, modification after crushtests or changes going together with Design manual.	OJT	Formal Training needed
Highway Engineer 3 (1 DC 3)	3.94	11			
			Computational tasks	NT	
			Prepares analysis and investigative reports for engineering studies.	OJT & NT	Formal training needed
			Supervises construction tasks and technical personnel (programmers)	NT	Formal training needed
			Supervises distribution of funds	NT	Formal training needed
Highway Engineer S4 (6 DC 4)	3.63	11			Inconsistent training between districts
			Authorizing and approving the final check on construction progress and final estimates.	OJT	
			Enforcing specifications and procedural requirements established by the Department.	FT & OJT	

NT - No Training
FT - Formal training

OJT - On-the-job Training

Job Classification	Job Performance	# of Responses	Training Needs	Training Provided	Notes
			Reviewing construction reports for accuracy and completeness.	FT & OJT	
Highway Engineer S4 (6 DC 4): Design Division, Bridge Rehabilitation Unit	Not Rated	1	See notes		No formal training provided
Highway Engineer S4 (6 DC 4): Design Division, traffic design section	Not Rated	1	See notes		No formal training provided
Highway Engineer S5 (6 DC 5)	3.61	7			
Construction Engineer 3(1 DZ 3)	4	5			Job Performance O.K.
Engineering Specialists 2 (1 DT 2)	2.18	2	See notes	OJT, NT & FT	Training needed for all areas.
Engineering Assistant 1 (3 AB 1)	3.9	16			
Engineering Assistant 1 (3 AB 1)	Not Rated	1			
Engineering Assistant S3 (8 AB 3)	3.88	16			
Engineering Assistant S3 (8 AB 3): Design Division, Plan Development Section	Not Rated	1	See notes		No formal training provided
Draftsman 2 and 3 (3 AA 2 and 3)	Not Rated	2			
Surveyor 2 (1 DS 2)	4	5			Adequate training and performance.
Environmental Scientist 3 (1 LS 3)	3.33	2			
			Interpeting legal environmental requirements	OJT	Need formal training
Information Specialist 3 (2 LA 3)	4.88	2			
Personal Officer 1 (2 NB 1)	3.73	1			

NT - No Training
FT - Formal training
OJT - On-the-job Training

Job Classification	Job Performance	# of Responses	Training Needs	Training Provided	Notes
Personal Officer 3 (2 NB 3)	4	2			
Accountant 2 (2 RA 2)	Not Rated	1	See notes		No formal training provided
Accountant 3 (2 RA 3)	Not Rated	1			
Accountant 6 (2 RA 6)	Not Rated	1			
Development Specialist 1 (2 SA 1)	2.91	2			Training needed
			Analyzes effect of projects on areas using cost/benefit and input/output analysis submitting information to local governments and state highway department.	NT	
			Evaluates impacts of alternative projects examining design estimates and applying highway engineering, economic, and environmental analysis.	NT	
Appraiser 2 and 3 (2TT 2 and 3)	Not Rated	2	See notes		No formal training provided
Program Coordinator 3 (2 WM 3)	4.94	8	see notes		No formal training provided
Program Coordinator 4 (2 WM 4)	Not Rated	1			
Program Coordinator 5 (2 WM 5)	3.75	3			
Subdistrict Manager (2 WQ 2)	3.83	8			

NT - No Training
FT - Formal training

OJT - On-the-job Training

Job Classification	Job Performance	# of Responses	Training Needs	Training Provided	Notes
			Developing and analyzing subdistrict schedules that access priorities between units and reflect the priorities of the District and Department.	NT, OJT & FT	
			Submitting an annual work program that accurately identifies the road needs, to include identifying large projects, making good projection of material requirments, and needs for rotated or rental equipment.	FT & OJT	
Maintenance Repair 2 and 3 (4IA2 and 3)	4.21	6			
Highway Maintenance Worker 2 and 3 (4 MB 2 and 3)	4.47	13			
Highway Maintenance S4 and S5 (9 MB 4 and 9 MB 5)	Not Rated	5			
Field Investigator 3 (3 KB 3)	Not Rated	5			
Personal Technician (3 LC 3)	3.22	1			
Electronics Technician (9 GA 4)	Not Rated	1			
Art Illustrator 5 (2 LG 5)	Not Rated	1			

NT - No Training
FT - Formal training
OJT - On-the-job Training

BENCHMARKING STUDY REPORT

COMPARISONS OF INDOT TO OTHER RESPONDING STATES

As shown in Part 1 of the table, scores for INDOT on most of the variables are close to the means for the other 24 states. The following are some observations regarding differences and similarities between INDOT and the other 24 states:

- INDOT has somewhat fewer employees than average.
- INDOT has more divisions than average, which is indicative of greater functional differentiation.
- INDOT is not experiencing a shortage computer skills in the labor market, while 61% of the other states are experiencing computer skill shortages.
- INDOT's Training Section is more than 2.5 times smaller than average, and its Training Section staff has less than 50% of the years of training experience of other states.
- The budget of INDOT's Training Section is much lower than average. However, INDOT provides more than 2.5 times the average hours of formal training of the other 24 states, at approximately half the average cost per employee.
- The number of new training programs initiated by the INDOT Training Section INDOT's is far lower than the average of the other 24 states.
- INDOT does not use NICET certification, while other states use it to a moderate extent.
- INDOT's training function is more centralized than that of the other states. More than double the training is taught, financed, and approved by the Training Section than the average of the other states. In addition, INDOT's Training Section, as opposed to the districts and divisions, is responsible for more training-related activities (i.e., administration, instructional design, needs analysis) than the other states. This is particularly interesting in light of INDOT's smaller Training Section size and budget.
- INDOT's use of lecture, computer-based training, and networked information systems for training is similar to the average use of these training methods by the other 24 states. INDOT uses more interactive training methods and more simulations for training than do the other states. In addition, other states anticipate using more distance learning in the next five years, while INDOT anticipates no change in the use of distance learning.
- As stated above, INDOT's use of computer-based training is similar to that of other states. However, while 65% of the 24 states have a policy regarding the use of work time for CBT, INDOT does not. In addition, 40% of INDOT employees have access to the internet, while an average of 60% of employees in other states have access.
- While INDOT's assessment of training outcomes during and immediately following training are similar to that of other states, INDOT measures transfer of training (i.e., performance evaluations back on the job) to a lesser extent. Recent research has demonstrated no relationships and negative relationships between immediate training outcomes and longer-term outcomes. This suggests that trainee reactions, knowledge tests, and work samples collected during or immediately following training are not indicative of the amount learned or the extent to which skills transfer back to the job. INDOT should therefore measure training effectiveness by assessing transfer of training.
- INDOT uses training outcome evaluations to make changes in training programs, decisions about whom to retrain, to evaluate the performance of trainers, and to gain support for future

training efforts more than the other 24 states do on average. This is commendable, but further highlights the importance of measuring transfer of training.

- Like most of the other states, INDOT does not use the pretest-posttest with control group design to assess training program effectiveness. INDOT also does not the use time-series design, while 42% of the other states use this design to assess training program effectiveness. These two designs are far superior to the other options – posttest only, posttest only with control group, pretest-posttest (with no control group). INDOT and 67% of the other states use the posttest only design to assess training program effectiveness. Unfortunately, this design can provide absolutely no useful information regarding training program effectiveness. (See the Training Director Interview, question 104 for definitions of the various training outcome assessment designs.)
- The quality of INDOT's transfer environment – support for obtaining and using skills learned in training - is similar to that of other states on all dimensions. However, neither INDOT nor the other states scored high on any dimension. INDOT and the other states scored highest on "co-worker support for obtaining training and using skills learned."
- INDOT's workforce was rated as slightly less adaptive and flexible than the average of the other states. INDOT's workforce was rated as doing a fair job on these performance dimensions. However, like the other states, INDOT's Training Section was on budget last year and most of its projects and plans were completed on time and within budget.

RELATIONSHIPS AMONG VARIABLES

Following are some observed relationships among the variables collected, which may be of interest to INDOT. The number of states included in each correlation vary from 13 to 25, depending on the number of responses to each pair of questions.

- The more functionally differentiated (i.e., larger number of divisions) the DOT,
  - The more interpersonal and computer skill shortages found in the labor market
  - The more likely the DOT is to increase training of new hires and less likely to decrease job qualifications to deal with skill shortages.
  - The more likely to discourage obtaining training and using skills learned in training
  - The lower the effectiveness of the Training Section
  - The less adaptive the workforce

- The more standardized the formal training,
  - The more likely on-the-job training is also standardized.
  - The greater use of computer-based-training
  - The more likely to use training evaluations to make decision about training budget changes
  - The more likely to use some kind of training outcome assessment design.
  - The more co-worker support for training

- The more standardized the on-the-job training,
  - The less likely the DOT is to face computer skills shortages

- The less likely the Training Director was educated as an engineer.
- The greater the centrality of the training Section, that is, the more the interests of the Training Section are represented in top management strategic decisions,
- The more likely to use training evaluations to make decision about training budget changes
- The more likely to use some kind of training outcome assessment design.
- The more supervisor support for training

- When the Training Section is part of the Human Resources Department,
  - The state is more likely to be a "right to work" state
  - The HR Director is more likely to be a member of the top management team
  - The less likely the Training Director was educated as an engineer.
  - The less districts and divisions spend on training

- The more top management support for training,
  - The greater the extent to which formal training needs analyses are performed.
  - The more likely the Training Director has a management, business, or HR educational background.
  - The greater the centrality of the training Section.
  - The more likely training outcomes of most types are assessed (e.g., trainee reactions, knowledge tests, work samples, supervisor and self-evaluations back on the job)
  - The more likely training outcome assessments are used to make training-related decisions and changes
  - The better the transfer environment.

- The greater the extent to which formal training needs analyses are performed.
  - The more courses are taken at outside agencies (e.g., NHI)
  - The greater the centrality of the training Section.
  - The more likely training outcomes are assessed
  - The more likely training outcome assessments are used to make training-related decisions and changes
  - The better the transfer environment.

- The higher the Training Section budget,
  - The greater the number of employees in both the DOT and the Training Section
  - The more employees are transferred to jobs with different duties
  - The greater the extent to which formal training needs analyses are performed.
  - The more likely the Training Director is to have an engineering educational background
  - The greater the rate of initiation of new training programs by districts and divisions
  - The better the transfer environment in terms of greater supervisor support for training and less discouragement of training.

- The greater the centrality of the Training Section, defined as, the more the interests of the Training Section are represented in top management strategic decisions,
  - The more standardized the formal and on-the-job training
  - The more top management support for training
  - The greater the extent to which formal training needs analyses are performed.
  - The greater the use of self-evaluations back on the job and work samples to assess training outcomes
  - The more use of outcome evaluations to make decisions regarding future training, to obtain support for future training efforts, and to reward trainers.
  - The better the transfer environment in terms of providing more rewards for training, more supervisor support of training, and increased facilitation of skill use by job.

- The greater the adaptability of the workforce in the face of problems, changes, and emergencies,
  - The less functional differentiation (i.e., fewer divisions).
  - The more standardized the training function
  - The less the shortage of interpersonal skills in the labor market.
  - The more likely the HR Director is part of the top management team
  - The greater top management support for training
  - The more hours of formal training provided per employee
  - The more likely the DOT is to have a policy regarding using work time for computer-based training
  - The more training outcome assessments are used to support future training efforts
  - The less training is discouraged in the job (transfer) environment

Appendix X: Benchmarking Survey Results (Part 1)

Variable	Item Number(s)	INDOT	Mean for Other States	Standard Deviation	No. of Other States
DOT Characteristics.					
Date DOT Founded	Q2	1919	1922	43.68	21
Number of full-time Employees	Q3	5200	5621.92	4695.6	24
Number of Districts	Q4	8	7.77	2.76	22
Number of Divisions	Q5+Q6	22	18.72	11.43	18
Standardization of DOT Practices (1-5 scale)	Ave. Q7-Q14	4	3.68	0.5	24
Is HR Director Part of the Top Management Team? (% yes)	Q34	Yes	42%	50%	24
Training-Related Environmental Characteristics.					
Right To Work State (% yes)	Q16	Yes	67%	48%	21
Extent to which State Laws Require Training (1-5 scale)	Q15	3	2.54	0.93	24
Union Support for Training (1-5 scale)	Q138	4	3.8	1.08	15
Extent to Which Union Contracts Have Specific Training Requirements. (1-5 scale)	Q139	3	2.15	1.21	13
Labor Market Issues.					
Extent to which new hires have needed skills (1-5 scale)	Q17	3	3.25	0.79	24
Existence of Skill Shortages in Labor Market.					
Professional Skill Shortage (% yes)	Q19A	Yes	57%	51%	23
Managerial Skill Shortage (% yes)	Q19B	Yes	13%	34%	23
Interpersonal Skill Shortage (% yes)	Q19C	Yes	35%	49%	23
Clerical Skill Shortage (% yes)	Q19D	No	9%	29%	23
Computer Skill Shortage (% yes)	Q19E	No	61%	50%	23
Literacy Skill Shortage (% yes)	Q19F	No	13%	34%	23
Physical Skill Shortage (% yes)	Q19G	No	9%	29%	23
How DOT Addresses Skill Shortages.					
Change Recruiting Strategies (% yes)	Q20A	Yes	84%	37%	19
"Borrow" or "Raid" from Other Areas of DOT (% yes)	Q20B	Yes	42%	51%	19
Provide More Training to New Hires (% yes)	Q20C	Yes	79%	42%	19
Increase Job Qualifications (% yes)	Q20D	Yes	32%	48%	19
Decrease Job Qualifications (% yes)	Q20E	No	26%	45%	19
Adopt New Technologies (% yes)	Q20F	Yes	58%	51%	19
Consider New Technologies (% yes)	Q20G	Yes	68%	48%	19

Appendix X: Benchmarking Survey Results (Part 1)

Variable	Item Number(s)	INDOT	Mean for Other States	Standard Deviation	No. of Other States
Training Department or Function Characteristics.					
Is Training Function Part of the HR? (% yes)	Q21	Yes	71%	46%	24
Is Training Director Part of the Top Management Team? (% yes)	Q35	No	0%	0%	24
Top Mgt. Support For Training (1-5 scale)	Ave. Q105-Q112	2.75	3.36	0.86	24
Interests of Training Dept. Represented In Top Mgt. Strategic Decisions.(1-5 scale)	Ave. Q67-Q72	3.5	3.14	0.97	24
Age Of Training Department (years)	2000-Q23	16	19.87	10.71	23
Number of Employees in Training Department	Q24	4	10.71	9.18	24
Ave. IRS. Training Experience of Training Dept. Employees	Q25	4	9.13	4.49	24
% Training Dept. Employees with Training Education	Q26	25%	19.00%	1704.00%	24
% Training Dept. Employees with Engineering Education	Q27	0%	3.38%	7.92%	24
Educational Background of Training Director.					
Training or Education (% yes)	Q28A	Yes	50%	51%	22
Management, Business, or Human Resources (% yes)	Q28B	No	59%	50%	22
Engineering (% yes)	Q28C	No	9%	29%	22
Liberal Arts, Sciences (% yes)	Q28D	No	36%	49%	22
Training Resources.					
Training Department Budget ($)	Q36	600000	763050	674959.45	20
$ Spent on Training by Divisions & Districts	Q37	Unknown	458916.67	578532.23	12
Hours of Formal Training Per Employee Per Year	Q38	75	29.38	18.84	17
$ Spent of Formal Training Per Employee Per Year	Q39	115	306.89	388.78	13
Hours of On-The-Job Training Per Employee Per Year	Q73	75	38.46	27.74	13
$ Spent of On-The-Job Training Per Employee Per Year	Q74	Unknown	615.7	749.97	9
# New Training Programs Initiated by Training Dept. in Last Year	Q40	3	8.33	10.69	24
# New Training Programs Initiated by Districts & Divisions in Last Year	Q41	0	11.41	13.92	17
Change in Rate of Training Program Initiation (1-3 scale, 3=increased)	Q42	3	2.71	0.55	24
Training and Training-Related Policies and Practices.					
% of Training that is Formal (v. On-The-Job Training)	Q29	65%	60.15%	25.78%	20
Extent to Which On-The-Job Training is Formalized (1-5 scale)	Ave. Q75-Q83	2.67	2.55	0.57	23
% Training Programs Purchased (v. Developed In-house)	Q31	50%	55.65%	31.49%	23
Extent to Which Courses Taken Outside DOT (e.g., HI) (1-5 scale)	Q32	4	3.42	1.06	24
Extent Incept Certification Used (1-5 scale)	Q33	1	2.53	1.59	17
% Training Taught by Financed, Approved by Training Department	Ave. Q58-Q61	85%	42.50%	27.41%	24
Responsibility For Training-Related Activities (1=Divisions/Districts, 5= Training De	Ave. Q62-Q66	4.4	3.19	0.75	24
Standardization of Formal Training (1-5 scale)	Q13	4	3.87	0.95	24
Standardization of On-The-Job Training (1-5 scale)	Q14	3	2.75	0.94	24

Appendix X: Benchmarking Survey Results (Part 1)

Variable	Item Number(s)	INDOT	Mean for Other States	Standard Deviation	No. of Other States
Training Methods.					
Extent to Which Various Training Methods Used.					
Lecture (1-5 scale)	Q43	3	3.04	1.27	24
Interactive Methods (1-5 scale)	Q45	5	3.83	0.92	24
Computer-Based Training (CBI) (1-5 scale)	Q47	2	2.17	0.87	24
% of CBI Incorporating Audio/Video	Q48	50	46.11	39.98	9
Existence of Policy Allowing Work Time for CBI (% yes)	Q56	No	65%	49%	23
% Employees with Access To Internet	Q57	40%	59.73%	30.32%	22
Distance Learning (1-5 scale)	Q50	2	1.96	0.91	24
Networked Info Systems (1-5 scale)	Q52	2	1.96	0.95	24
Simulations (1-5 scale)	Q54	4	2.09	0.95	23
Expected Change in Use of Training Methods in Next 5 Years.					
Lecture (1-5 scale)	Q44	3	2.17	1.05	24
Interactive Methods (1-5 scale)	Q46	4	4.08	1.1	24
Computer-Based Training (CBI) (1-5 scale)	Q49	4	4.37	0.58	24
Distance Learning (1-5 scale)	Q51	3	4.08	0.65	24
Networked Info System (1-5 scale)	Q53	3	3.83	0.78	23
Simulations (1-5 scale)	Q55	4	3.48	0.79	23
Other Training Practices.					
Extent to Which Formal Training Needs Analyses are Performed (1-5 scale)	Ave. Q84-Q90	2.63	2.98	0.9	24
Training Outcome Evaluation.					
Extent to Which Different Types of Evaluations are Performed.					
Trainee Reactions (1-5 scale)	Q92	5	4.25	0.85	24
Knowledge Tests (1-5 scale)	Q93	2	2.58	0.58	24
Work Samples at the End of Training Sessions (1-5 scale)	Q94	2	2.21	0.83	24
Supervisors Evaluations Back on the Job (1-5 scale)	Q95	1	1.92	0.97	24
Self-Evaluations Back on the Job (1-5 scale)	Q96	1	2.3	1.15	23
Trainer Evaluations Back on the Job (1-5 scale)	Q97	1	2.12	1.23	24

Appendix X: Benchmarking Survey Results (Part 1)

Variable	Item Number(s)	INDOT	Mean for Other States	Standard Deviation	No. of Other States
How Training Outcome Evaluations Are Used.					
To Make Changes in Training Programs (1-5 scale)	Q98	5	3.71	1.12	24
To Make Decisions About Need to Retrain (1-5 scale)	Q99	5	2.83	1.05	24
To Evaluate the Performance of Trainers (1-5 scale)	Q100	5	3.42	1.21	24
To Determine Rewards for Trainers (1-5 scale)	Q101	1	1.78	1.13	23
To Make Decisions About Training Budget Changes (1-5 scale)	Q102	2	2.13	0.95	24
To Gain Support for Future Training Efforts (1-5 scale)	Q103	4	3.21	1.1	24
Types of Evaluation Designs Used.					
Posttest Only (% yes)	Q104A	Yes	67%	48%	24
Posttest Only with Control Group (% yes)	Q104B	No	4%	20%	24
Pretest-Posttest (% yes)	Q104C	Yes	46%	51%	24
Pretest-Posttest with Control Group (% yes)	Q104D	No	4%	20%	24
Time Series (% yes)	Q104E	No	42%	50%	24
No Evaluation Design (% yes)	Q104F	No	54%	51%	24
Quality of Transfer Environment.					
Rewards Given for Obtaining Training & Using Skills Learned (1-5 scale)	Ave. Q135-Q137	2	2.49	0.76	24
Obtaining Training & Using Skills Learned Discouraged (1-5 scale)	Ave. Q114, Q118, Q119, Q121, Q123, Q130	2.5	2.26	0.6	24
Supervisor Support for Obtaining Training & Using Skills Learned (1-5 scale)	Ave. Q113, Q115-Q117, Q120, Q122, Q124, Q125	2.6	3.21	0.57	24
Coworker Support for Obtaining Training & Using Skills Learned (1-5 scale)	Ave. Q128, Q129, Q131	3.67	3.4	0.54	24
Use of Skills Facilitated by Job (1-5 scale)	Ave. Q132-134	3	3.32	0.72	24
Training-Related Organizational Performance Outcomes.					
Adaptability of Workforce in Face of Problems, Changes, & Emergencies (1-5 scale	Ave. Q140-Q144	3.2	3.63	0.48	24
Flexibility of Workforce When Transferred to Jobs with Different Duties (1-5 scale)	Ave. Q146, Q148, Q150	3	3.53	0.52	19
% Employees Transferred in Last Year	Ave. Q145, Q147, Q149	Unknown	12.02	17.86	15
Training Department Budget Spending Last Year (1=Under, 3=On, 5= Over Budget)	Q151	3	3.05	0.58	22
% of Training Department Projects & Plans Completed On-Time & within Budget	Ave. Q152-Q155	87.50%	86.84%	13.60%	24

Appendix X: Benchmarking Survey Results (Part 1)

Variable	Item Number(s)	Alabama	Arizona	Connecticut
DOT Characteristics.				
Date DOT Founded	Q2		1976	1895
Number of full-time Employees	Q3	3800	4800	3700
Number of Districts	Q4	9	Unknown	4
Number of Divisions	Q5+Q6		Unknown	7
Standardization of DOT Practices (1-5 scale)	Ave. Q7-Q14	3.38	3.63	3.88
Is HR Director Part of the Top Management Team? (% yes)	Q34	No	No	Yes
Training-Related Environmental Characteristics.				
Right To Work State (% yes)	Q16	Yes	Yes	No
Extent to which State Laws Require Training (1-5 scale)	Q15	1	3	4
Union Support for Training (1-5 scale)	Q138		5	3
Extent to Which Union Contracts Have Specific Training Requirements. (1-5 scale)	Q139		1	3
Labor Market Issues.				
Extent to which new hires have needed skills (1-5 scale)	Q17	3	3	4
Existence of Skill Shortages in Labor Market.				
Professional Skill Shortage (% yes)	Q19A	Yes	Yes	No
Managerial Skill Shortage (% yes)	Q19B	No	No	No
Interpersonal Skill Shortage (% yes)	Q19C	No	No	No
Clerical Skill Shortage (% yes)	Q19D	No	No	No
Computer Skill Shortage (% yes)	Q19E	Yes	Yes	No
Literacy Skill Shortage (% yes)	Q19F	No	Yes	No
Physical Skill Shortage (% yes)	Q19G	No	Yes	No
How DOT Addresses Skill Shortages.				
Change Recruiting Strategies (% yes)	Q20A	Yes	Yes	No
"Borrow" or "Raid" from Other Areas of DOT (% yes)	Q20B	No	No	No
Provide More Training to New Hires (% yes)	Q20C	Yes	Yes	No
Increase Job Qualifications (% yes)	Q20D	No	Yes	No
Decrease Job Qualifications (% yes)	Q20E	Yes	No	No
Adopt New Technologies (% yes)	Q20F	Yes	Yes	No
Consider New Technologies (% yes)	Q20G	Yes	Yes	No

Appendix X: Benchmarking Survey Results (Part 1)

Variable	Item Number(s)	Alabama	Arizona	Connecticut
Training Department or Function Characteristics.				
Is Training Function Part of the HR? (% yes)	Q21	No	No	Yes
Is Training Director Part of the Top Management Team? (% yes)	Q35	No	No	No
Top Mgt. Support For Training (1-5 scale)	Ave. Q105-Q112	3.88	5	3.63
Interests of Training Dept. Represented In Top Mgt. Strategic Decisions.(1-5 scale)	Ave. Q67-Q72	4.5	4.33	2.17
Age Of Training Department (years)	2000-Q23	3	19	31
Number of Employees in Training Department	Q24	15	28	5
Ave. IRS. Training Experience of Training Dept. Employees	Q25	8	10	3
% Training Dept. Employees with Training Education	Q26	13	0	50
% Training Dept. Employees with Engineering Education	Q27	7	0	0
Educational Background of Training Director.				
Training or Education (% yes)	Q28A	No	No	No
Management, Business, or Human Resources (% yes)	Q28B	Yes	Yes	No
Engineering (% yes)	Q28C	Yes	No	No
Liberal Arts, Sciences (% yes)	Q28D	No	No	Yes
Training Resources.				
Training Department Budget ($)	Q36	2400000	700000	600000
$ Spent on Training by Divisions & Districts	Q37	500000	800000	100000
Hours of Formal Training Per Employee Per Year	Q38	27	30	15
$ Spent of Formal Training Per Employee Per Year	Q39	505	500	165
Hours of On-The-Job Training Per Employee Per Year	Q73	5	50	45
$ Spent of On-The-Job Training Per Employee Per Year	Q74	50	Unknown	27
# New Training Programs Initiated by Training Dept. in Last Year	Q40	25	15	9
# New Training Programs Initiated by Districts & Divisions in Last Year	Q41	15	50	4
Change in Rate of Training Program Initiation (1-3 scale, 3=increased)	Q42	3	3	2
Training and Training-Related Policies and Practices.				
% of Training that is Formal (v. On-The-Job Training)	Q29	80	75	90
Extent to Which On-The-Job Training is Formalized (1-5 scale)	Ave. Q75-Q83	2.44	1.78	2.56
% Training Programs Purchased (v. Developed In-house)	Q31	95	50	10
Extent to Which Courses Taken Outside DOT (e.g., HI) (1-5 scale)	Q32	4	5	2
Extent Incept Certification Used (1-5 scale)	Q33	3	5	
% Training Taught by Financed, Approved by Training Department	Ave. Q58-Q61	75	46.25	63.33
Responsibility For Training-Related Activities (1=Divisions/Districts, 5= Training De	Ave. Q62-Q66	5	3.6	3.6
Standardization of Formal Training (1-5 scale)	Q13	4	4	4
Standardization of On-The-Job Training (1-5 scale)	Q14	2	2	2

Appendix X: Benchmarking Survey Results (Part 1)

Variable	Item Number(s)	Alabama	Arizona	Connecticut
Training Methods.				
Extent to Which Various Training Methods Used.				
Lecture (1-5 scale)	Q43	5	2	5
Interactive Methods (1-5 scale)	Q45	4	5	4
Computer-Based Training (CBI) (1-5 scale)	Q47	1	3	2
% of CBI Incorporating Audio/Video	Q48		0	50
Existence of Policy Allowing Work Time for CBI (% yes)	Q56	Yes	Yes	No
% Employees with Access To Internet	Q57	50	100	8
Distance Learning (1-5 scale)	Q50	1	1	1
Networked Info Systems (1-5 scale)	Q52	1	1	2
Simulations (1-5 scale)	Q54	1	4	1
Expected Change in Use of Training Methods in Next 5 Years.				
Lecture (1-5 scale)	Q44	5	1	2
Interactive Methods (1-5 scale)	Q46	3	5	3
Computer-Based Training (CBI) (1-5 scale)	Q49	4	5	4
Distance Learning (1-5 scale)	Q51	5	4	3
Networked Info System (1-5 scale)	Q53	4	2	4
Simulations (1-5 scale)	Q55	3	5	3
Other Training Practices.				
Extent to Which Formal Training Needs Analyses are Performed (1-5 scale)	Ave. Q84-Q90	3.75	5	2.75
Training Outcome Evaluation.				
Extent to Which Different Types of Evaluations are Performed.				
Trainee Reactions (1-5 scale)	Q92	5	3	5
Knowledge Tests (1-5 scale)	Q93	3	3	2
Work Samples at the End of Training Sessions (1-5 scale)	Q94	4	4	2
Supervisors Evaluations Back on the Job (1-5 scale)	Q95	1	2	3
Self-Evaluations Back on the Job (1-5 scale)	Q96	4	2	2
Trainer Evaluations Back on the Job (1-5 scale)	Q97	1	2	5

Appendix X: Benchmarking Survey Results (Part 1)

Variable	Item Number(s)	Alabama	Arizona	Connecticut
How Training Outcome Evaluations Are Used.				
To Make Changes in Training Programs (1-5 scale)	Q98	4	5	4
To Make Decisions About Need to Retrain (1-5 scale)	Q99	4	3	4
To Evaluate the Performance of Trainers (1-5 scale)	Q100	4	2	4
To Determine Rewards for Trainers (1-5 scale)	Q101		1	2
To Make Decisions About Training Budget Changes (1-5 scale)	Q102	3	1	2
To Gain Support for Future Training Efforts (1-5 scale)	Q103	4	3	4
Types of Evaluation Designs Used.				
Posttest Only (% yes)	Q104A	Yes	No	No
Posttest Only with Control Group (% yes)	Q104B	No	No	No
Pretest-Posttest (% yes)	Q104C	Yes	Yes	No
Pretest-Posttest with Control Group (% yes)	Q104D	No	Yes	No
Time Series (% yes)	Q104E	No	No	No
No Evaluation Design (% yes)	Q104F	No	No	Yes
Quality of Transfer Environment.				
Rewards Given for Obtaining Training & Using Skills Learned (1-5 scale)	Ave. Q135-Q137	2.33	2	3
Obtaining Training & Using Skills Learned Discouraged (1-5 scale)	Ave. Q114, Q118, Q119, Q121, Q123, Q130	1	2.67	2
Supervisor Support for Obtaining Training & Using Skills Learned (1-5 scale)	Ave. Q113, Q115-Q117, Q120, Q122, Q124, Q125	3	3	2.8
Coworker Support for Obtaining Training & Using Skills Learned (1-5 scale)	Ave. Q128, Q129, Q131	3.67	3	4
Use of Skills Facilitated by Job (1-5 scale)	Ave. Q132-134	4.33	3.33	3.33
Training-Related Organizational Performance Outcomes.				
Adaptability of Workforce in Face of Problems, Changes, & Emergencies (1-5 scale	Ave. Q140-Q144	3.4	4	4
Flexibility of Workforce When Transferred to Jobs with Different Duties (1-5 scale)	Ave. Q146, Q148, Q150	3	3	4
% Employees Transferred in Last Year	Ave. Q145, Q147, Q149	75	8.33	
Training Department Budget Spending Last Year (1=Under, 3=On, 5= Over Budget)	Q151	4	3	3
% of Training Department Projects & Plans Completed On-Time & within Budget	Ave. Q152-Q155	91.25	87.5	90

Appendix X: Benchmarking Survey Results (Part 1)

Variable	Item Number(s)	Illinois	Iowa	Kansas	Maine	Maryland
DOT Characteristics.						
Date DOT Founded	Q2	1898	1975	1975	1923	1971
Number of full-time Employees	Q3	6689	3570	3100	2313	10047
Number of Districts	Q4	9	6	6	8	
Number of Divisions	Q5+Q6	16	13		13	
Standardization of DOT Practices (1-5 scale)	Ave. Q7-Q14	4	4.17	3.88	3.25	3.88
Is HR Director Part of the Top Management Team? (% yes)	Q34	No	No	No	Yes	Yes
Training-Related Environmental Characteristics.						
Right To Work State (% yes)	Q16	No	Yes	Yes	Yes	No
Extent to which State Laws Require Training (1-5 scale)	Q15	2	2	3	4	2
Union Support for Training (1-5 scale)	Q138	4	4	3	3	5
Extent to Which Union Contracts Have Specific Training Requirements. (1-5 scale)	Q139	2	1	1	2	3
Labor Market Issues.						
Extent to which new hires have needed skills (1-5 scale)	Q17	4	4	4	2	2
Existence of Skill Shortages in Labor Market.						
Professional Skill Shortage (% yes)	Q19A	Yes	Yes	Yes	No	Yes
Managerial Skill Shortage (% yes)	Q19B	Yes	No	No	No	No
Interpersonal Skill Shortage (% yes)	Q19C	Yes	No	No	Yes	No
Clerical Skill Shortage (% yes)	Q19D	No	No	No	No	No
Computer Skill Shortage (% yes)	Q19E	No	No	Yes	Yes	Yes
Literacy Skill Shortage (% yes)	Q19F	No	No	No	No	Yes
Physical Skill Shortage (% yes)	Q19G	No	No	No	No	No
How DOT Addresses Skill Shortages.						
Change Recruiting Strategies (% yes)	Q20A	No	Yes	Yes	Yes	Yes
"Borrow" or "Raid" from Other Areas of DOT (% yes)	Q20B	No	Yes	No	No	Yes
Provide More Training to New Hires (% yes)	Q20C	Yes	Yes	Yes	Yes	No
Increase Job Qualifications (% yes)	Q20D	No	No	No	No	Yes
Decrease Job Qualifications (% yes)	Q20E	No	No	No	Yes	Yes
Adopt New Technologies (% yes)	Q20F	Yes	No	Yes	No	No
Consider New Technologies (% yes)	Q20G	No	Yes	Yes	Yes	Yes

Appendix X: Benchmarking Survey Results (Part 1)

Variable	Item Number(s)	Illinois	Iowa	Kansas	Maine	Maryland
Training Department or Function Characteristics.						
Is Training Function Part of the HR? (% yes)	Q21	No	Yes	Yes	Yes	Yes
Is Training Director Part of the Top Management Team? (% yes)	Q35	No	No	No	No	No
Top Mgt. Support For Training (1-5 scale)	Ave. Q105-Q112	3.63	3	1.75	3.63	3
Interests of Training Dept. Represented In Top Mgt. Strategic Decisions.(1-5 scale)	Ave. Q67-Q72	4	2.67	2.83	3.5	3
Age Of Training Department (years)	2000-Q23	25	32	21	15	29
Number of Employees in Training Department	Q24	8	4	6	4	25
Ave. IRS. Training Experience of Training Dept. Employees	Q25	7	10	4	6	12
% Training Dept. Employees with Training Education	Q26	30	No	33	No	20
% Training Dept. Employees with Engineering Education	Q27	0	0	0	0	0
Educational Background of Training Director.						
Training or Education (% yes)	Q28A	Yes		No	No	Yes
Management, Business, or Human Resources (% yes)	Q28B	No		No	Yes	No
Engineering (% yes)	Q28C	No		No	No	No
Liberal Arts, Sciences (% yes)	Q28D	No		Yes	No	Yes
Training Resources.						
Training Department Budget ($)	Q36	160000		135000		
$ Spent on Training by Divisions & Districts	Q37	732000		400000		
Hours of Formal Training Per Employee Per Year	Q38			50		75
$ Spent of Formal Training Per Employee Per Year	Q39			160		1500
Hours of On-The-Job Training Per Employee Per Year	Q73			10		50
$ Spent of On-The-Job Training Per Employee Per Year	Q74			5		1000
# New Training Programs Initiated by Training Dept. in Last Year	Q40	0	3	4	13	15
# New Training Programs Initiated by Districts & Divisions in Last Year	Q41	3		25	2	35
Change in Rate of Training Program Initiation (1-3 scale, 3=increased)	Q42	1	3	3	3	2
Training and Training-Related Policies and Practices.						
% of Training that is Formal (v. On-The-Job Training)	Q29	60		30	50	10
Extent to Which On-The-Job Training is Formalized (1-5 scale)	Ave. Q75-Q83	2.89	2.17	1.56	2.71	2.44
% Training Programs Purchased (v. Developed In-house)	Q31	80		50	50	80
Extent to Which Courses Taken Outside DOT (e.g., HI) (1-5 scale)	Q32	5	3	2	2	4
Extent Incept Certification Used (1-5 scale)	Q33	5		1	2	5
% Training Taught by Financed, Approved by Training Department	Ave. Q58-Q61	27.5	10	7.5	27.5	5
Responsibility For Training-Related Activities (1=Divisions/Districts, 5= Training De	Ave. Q62-Q66	4.2	3	3	3.2	2.8
Standardization of Formal Training (1-5 scale)	Q13	5	5	4	2	4
Standardization of On-The-Job Training (1-5 scale)	Q14	4	3	3	2	2

Appendix X: Benchmarking Survey Results (Part 1)

Variable	Item Number(s)	Illinois	Iowa	Kansas	Maine	Maryland
Training Methods.						
Extent to Which Various Training Methods Used.						
Lecture (1-5 scale)	Q43	2	3	3	2	3
Interactive Methods (1-5 scale)	Q45	5	3	2	4	3
Computer-Based Training (CBI) (1-5 scale)	Q47	2	2	1	1	4
% of CBI Incorporating Audio/Video	Q48					80
Existence of Policy Allowing Work Time for CBI (% yes)	Q56	No	Yes	No	Yes	Yes
% Employees with Access To Internet	Q57	1		70	75	85
Distance Learning (1-5 scale)	Q50	2	2	1	1	3
Networked Info Systems (1-5 scale)	Q52	5	3	1	1	2
Simulations (1-5 scale)	Q54	2		1	3	2
Expected Change in Use of Training Methods in Next 5 Years.						
Lecture (1-5 scale)	Q44	2	2	1	1	4
Interactive Methods (1-5 scale)	Q46	5	2	5	5	2
Computer-Based Training (CBI) (1-5 scale)	Q49	3	4	5	4	5
Distance Learning (1-5 scale)	Q51	4	4	5	3	4
Networked Info System (1-5 scale)	Q53	5	4	5	3	3
Simulations (1-5 scale)	Q55	5		4	4	3
Other Training Practices.						
Extent to Which Formal Training Needs Analyses are Performed (1-5 scale)	Ave. Q84-Q90	3.75	1.5	1.38	3	2.25
Training Outcome Evaluation.						
Extent to Which Different Types of Evaluations are Performed.						
Trainee Reactions (1-5 scale)	Q92	4	5	4	3	5
Knowledge Tests (1-5 scale)	Q93	3	2	2	3	2
Work Samples at the End of Training Sessions (1-5 scale)	Q94	2	2	1	2	1
Supervisors Evaluations Back on the Job (1-5 scale)	Q95	1	2	1	2	2
Self-Evaluations Back on the Job (1-5 scale)	Q96	4		2	2	2
Trainer Evaluations Back on the Job (1-5 scale)	Q97	4	1	1	2	1

Appendix X: Benchmarking Survey Results (Part 1)

Variable	Item Number(s)	Illinois	Iowa	Kansas	Maine	Maryland
How Training Outcome Evaluations Are Used.						
To Make Changes in Training Programs (1-5 scale)	Q98	4	4	2	4	3
To Make Decisions About Need to Retrain (1-5 scale)	Q99	3	4	2	4	2
To Evaluate the Performance of Trainers (1-5 scale)	Q100	4	3	1	5	3
To Determine Rewards for Trainers (1-5 scale)	Q101	4	1	1	3	2
To Make Decisions About Training Budget Changes (1-5 scale)	Q102	4	2	1	1	1
To Gain Support for Future Training Efforts (1-5 scale)	Q103	4	3	2	4	4
Types of Evaluation Designs Used.						
Posttest Only (% yes)	Q104A	Yes	No	Yes	No	Yes
Posttest Only with Control Group (% yes)	Q104B	No	No	No	No	No
Pretest-Posttest (% yes)	Q104C	No	Yes	No	No	No
Pretest-Posttest with Control Group (% yes)	Q104D	No	No	No	No	No
Time Series (% yes)	Q104E	No	No	No	No	No
No Evaluation Design (% yes)	Q104F	No	Yes	Yes	Yes	Yes
Quality of Transfer Environment.						
Rewards Given for Obtaining Training & Using Skills Learned (1-5 scale)	Ave. Q135-Q137	3	2	1.33	3	2
Obtaining Training & Using Skills Learned Discouraged (1-5 scale)	Ave. Q114, Q118, Q119, Q121, Q123, Q130	2.33	2	2.83	2	1.67
Supervisor Support for Obtaining Training & Using Skills Learned (1-5 scale)	Ave. Q113, Q115-Q117, Q120, Q122, Q124, Q125	3.9	3.33	2.1	3.6	3.1
Coworker Support for Obtaining Training & Using Skills Learned (1-5 scale)	Ave. Q128, Q129, Q131	3.67	3	3	3	3.33
Use of Skills Facilitated by Job (1-5 scale)	Ave. Q132-134	3.67	3	2.33	3.67	2.67
Training-Related Organizational Performance Outcomes.						
Adaptability of Workforce in Face of Problems, Changes, & Emergencies (1-5 scale	Ave. Q140-Q144	3.8	4.2	3.4	4.2	4.2
Flexibility of Workforce When Transferred to Jobs with Different Duties (1-5 scale)	Ave. Q146, Q148, Q150					4.67
% Employees Transferred in Last Year	Ave. Q145, Q147, Q149			1		2.67
Training Department Budget Spending Last Year (1=Under, 3=On, 5= Over Budget)	Q151	4	4	3		3
% of Training Department Projects & Plans Completed On-Time & within Budget	Ave. Q152-Q155	91.25	99.67	47.5	100	93.75

Appendix X: Benchmarking Survey Results (Part 1)

Variable	Item Number(s)	Minnesota	Mississippi	Missouri
DOT Characteristics.				
Date DOT Founded	Q2	1905		1913
Number of full-time Employees	Q3	5300	3269	6500
Number of Districts	Q4	9	6	10
Number of Divisions	Q5+Q6	Unknown	24	35
Standardization of DOT Practices (1-5 scale)	Ave. Q7-Q14	3.25	4.25	3.13
Is HR Director Part of the Top Management Team? (% yes)	Q34	0	No	No
Training-Related Environmental Characteristics.				
Right To Work State (% yes)	Q16	No		Yes
Extent to which State Laws Require Training (1-5 scale)	Q15	4	3	1
Union Support for Training (1-5 scale)	Q138	4		1
Extent to Which Union Contracts Have Specific Training Requirements. (1-5 scale)	Q139	Unknown		1
Labor Market Issues.				
Extent to which new hires have needed skills (1-5 scale)	Q17	3	4	2
Existence of Skill Shortages in Labor Market.				
Professional Skill Shortage (% yes)	Q19A	Yes	No	Yes
Managerial Skill Shortage (% yes)	Q19B	No	Yes	No
Interpersonal Skill Shortage (% yes)	Q19C	No	Yes	Yes
Clerical Skill Shortage (% yes)	Q19D	No	No	No
Computer Skill Shortage (% yes)	Q19E	Yes	No	Yes
Literacy Skill Shortage (% yes)	Q19F	No	No	No
Physical Skill Shortage (% yes)	Q19G	No	No	No
How DOT Addresses Skill Shortages.				
Change Recruiting Strategies (% yes)	Q20A	Yes	Yes	Yes
"Borrow" or "Raid" from Other Areas of DOT (% yes)	Q20B	No	Yes	No
Provide More Training to New Hires (% yes)	Q20C	Yes	Yes	Yes
Increase Job Qualifications (% yes)	Q20D	No	Yes	Yes
Decrease Job Qualifications (% yes)	Q20E	No	No	No
Adopt New Technologies (% yes)	Q20F	Yes	Yes	No
Consider New Technologies (% yes)	Q20G	Yes	Yes	Yes

Appendix X: Benchmarking Survey Results (Part 1)

Variable	Item Number(s)	Minnesota	Mississippi	Missouri
Training Department or Function Characteristics.				
Is Training Function Part of the HR? (% yes)	Q21	Yes	Yes	Yes
Is Training Director Part of the Top Management Team? (% yes)	Q35	No	No	No
Top Mgt. Support For Training (1-5 scale)	Ave. Q105-Q112	3.25	4.88	2.63
Interests of Training Dept. Represented In Top Mgt. Strategic Decisions.(1-5 scale)	Ave. Q67-Q72	2.83	4.5	1.5
Age Of Training Department (years)	2000-Q23	Unknown	3	4
Number of Employees in Training Department	Q24	38	3	10
Ave. IRS. Training Experience of Training Dept. Employees	Q25	9	8	7
% Training Dept. Employees with Training Education	Q26	50	33	0
% Training Dept. Employees with Engineering Education	Q27	5	0	0
Educational Background of Training Director.				
Training or Education (% yes)	Q28A	Yes	Yes	No
Management, Business, or Human Resources (% yes)	Q28B	Yes	Yes	Yes
Engineering (% yes)	Q28C	No	No	No
Liberal Arts, Sciences (% yes)	Q28D	No	No	No
Training Resources.				
Training Department Budget ($)	Q36	459000		875000
$ Spent on Training by Divisions & Districts	Q37	Unknown		25000
Hours of Formal Training Per Employee Per Year	Q38	Unknown	32	5
$ Spent of Formal Training Per Employee Per Year	Q39	Unknown		15
Hours of On-The-Job Training Per Employee Per Year	Q73	Unknown	40	10
$ Spent of On-The-Job Training Per Employee Per Year	Q74	Unknown		
# New Training Programs Initiated by Training Dept. in Last Year	Q40	10	12	5
# New Training Programs Initiated by Districts & Divisions in Last Year	Q41	Unknown	5	10
Change in Rate of Training Program Initiation (1-3 scale, 3=increased)	Q42	3	3	3
Training and Training-Related Policies and Practices.				
% of Training that is Formal (v. On-The-Job Training)	Q29	Unknown	75	65
Extent to Which On-The-Job Training is Formalized (1-5 scale)	Ave. Q75-Q83	2.29	3.22	1.89
% Training Programs Purchased (v. Developed In-house)	Q31	30	75	20
Extent to Which Courses Taken Outside DOT (e.g., HI) (1-5 scale)	Q32	4	4	2
Extent Incept Certification Used (1-5 scale)	Q33	1	5	2
% Training Taught by Financed, Approved by Training Department	Ave. Q58-Q61	50	68.75	68.75
Responsibility For Training-Related Activities (1=Divisions/Districts, 5= Training De	Ave. Q62-Q66	3.2	3.4	3.6
Standardization of Formal Training (1-5 scale)	Q13	3	4	3
Standardization of On-The-Job Training (1-5 scale)	Q14	2	4	2

Appendix X: Benchmarking Survey Results (Part 1)

Variable	Item Number(s)	Minnesota	Mississippi	Missouri
Training Methods.				
Extent to Which Various Training Methods Used.				
Lecture (1-5 scale)	Q43	4	3	3
Interactive Methods (1-5 scale)	Q45	3	5	4
Computer-Based Training (CBI) (1-5 scale)	Q47	3	2	2
% of CBI Incorporating Audio/Video	Q48	Unknown		
Existence of Policy Allowing Work Time for CBI (% yes)	Q56	Yes		No
% Employees with Access To Internet	Q57	90	60	20
Distance Learning (1-5 scale)	Q50	3	2	2
Networked Info Systems (1-5 scale)	Q52	2	2	1
Simulations (1-5 scale)	Q54	2	3	4
Expected Change in Use of Training Methods in Next 5 Years.				
Lecture (1-5 scale)	Q44	2	3	2
Interactive Methods (1-5 scale)	Q46	5	5	4
Computer-Based Training (CBI) (1-5 scale)	Q49	4	4	4
Distance Learning (1-5 scale)	Q51	4	4	4
Networked Info System (1-5 scale)	Q53	4	4	4
Simulations (1-5 scale)	Q55	4	3	2
Other Training Practices.				
Extent to Which Formal Training Needs Analyses are Performed (1-5 scale)	Ave. Q84-Q90	2.38	4	2.38
Training Outcome Evaluation.				
Extent to Which Different Types of Evaluations are Performed.				
Trainee Reactions (1-5 scale)	Q92	4	5	4
Knowledge Tests (1-5 scale)	Q93	3	3	3
Work Samples at the End of Training Sessions (1-5 scale)	Q94	3	3	2
Supervisors Evaluations Back on the Job (1-5 scale)	Q95	1	2	1
Self-Evaluations Back on the Job (1-5 scale)	Q96	1	4	1
Trainer Evaluations Back on the Job (1-5 scale)	Q97	1	2	3

Appendix X: Benchmarking Survey Results (Part 1)

Variable	Item Number(s)	Minnesota	Mississippi	Missouri
How Training Outcome Evaluations Are Used.				
To Make Changes in Training Programs (1-5 scale)	Q98	2	4	5
To Make Decisions About Need to Retrain (1-5 scale)	Q99	1	4	3
To Evaluate the Performance of Trainers (1-5 scale)	Q100	2	4	5
To Determine Rewards for Trainers (1-5 scale)	Q101	1	2	2
To Make Decisions About Training Budget Changes (1-5 scale)	Q102	2	4	2
To Gain Support for Future Training Efforts (1-5 scale)	Q103	3	5	3
Types of Evaluation Designs Used.				
Posttest Only (% yes)	Q104A	Yes	Yes	No
Posttest Only with Control Group (% yes)	Q104B	No	No	No
Pretest-Posttest (% yes)	Q104C	Yes	Yes	No
Pretest-Posttest with Control Group (% yes)	Q104D	No	No	No
Time Series (% yes)	Q104E	Yes	Yes	No
No Evaluation Design (% yes)	Q104F	No	No	Yes
Quality of Transfer Environment.				
Rewards Given for Obtaining Training & Using Skills Learned (1-5 scale)	Ave. Q135-Q137	1.67	3.33	1.67
Obtaining Training & Using Skills Learned Discouraged (1-5 scale)	Ave. Q114, Q118, Q119, Q121, Q123, Q130	2.33	1.33	2.67
Supervisor Support for Obtaining Training & Using Skills Learned (1-5 scale)	Ave. Q113, Q115-Q117, Q120, Q122, Q124, Q125	3	4.3	2.7
Coworker Support for Obtaining Training & Using Skills Learned (1-5 scale)	Ave. Q128, Q129, Q131	3.33	4	2.33
Use of Skills Facilitated by Job (1-5 scale)	Ave. Q132-134	2.67	4.33	2
Training-Related Organizational Performance Outcomes.				
Adaptability of Workforce in Face of Problems, Changes, & Emergencies (1-5 scale	Ave. Q140-Q144	3.8	4	3
Flexibility of Workforce When Transferred to Jobs with Different Duties (1-5 scale)	Ave. Q146, Q148, Q150	3.67	4	3.33
% Employees Transferred in Last Year	Ave. Q145, Q147, Q149	Unknown	13.33	11.67
Training Department Budget Spending Last Year (1=Under, 3=On, 5= Over Budget)	Q151	3	4	2
% of Training Department Projects & Plans Completed On-Time & within Budget	Ave. Q152-Q155	70	93.75	90

Appendix X: Benchmarking Survey Results (Part 1)

Variable	Item Number(s)	North Carolina	Ohio	Vermont	Washington
DOT Characteristics.					
Date DOT Founded	Q2	1915	1904	1975	1910
Number of full-time Employees	Q3	14800	6200	1293	5500
Number of Districts	Q4	14	12	9	6
Number of Divisions	Q5+Q6	8	7	8	13
Standardization of DOT Practices (1-5 scale)	Ave. Q7-Q14	4.13	3.5	3.75	4.13
Is HR Director Part of the Top Management Team? (% yes)	Q34	No	Yes	No	Yes
Training-Related Environmental Characteristics.					
Right To Work State (% yes)	Q16	Yes		Yes	Yes
Extent to which State Laws Require Training (1-5 scale)	Q15	2	3	1	2
Union Support for Training (1-5 scale)	Q138		3	4	5
Extent to Which Union Contracts Have Specific Training Requirements. (1-5 scale)	Q139		3	2	5
Labor Market Issues.					
Extent to which new hires have needed skills (1-5 scale)	Q17	3	4	4	4
Existence of Skill Shortages in Labor Market.					
Professional Skill Shortage (% yes)	Q19A	No	No	No	No
Managerial Skill Shortage (% yes)	Q19B	No	No	No	No
Interpersonal Skill Shortage (% yes)	Q19C	No	No	No	No
Clerical Skill Shortage (% yes)	Q19D	No	No	No	No
Computer Skill Shortage (% yes)	Q19E	No	No	No	Yes
Literacy Skill Shortage (% yes)	Q19F	No	No	No	No
Physical Skill Shortage (% yes)	Q19G	No	No	No	No
How DOT Addresses Skill Shortages.					
Change Recruiting Strategies (% yes)	Q20A				Yes
"Borrow" or "Raid" from Other Areas of DOT (% yes)	Q20B				Yes
Provide More Training to New Hires (% yes)	Q20C				Yes
Increase Job Qualifications (% yes)	Q20D				No
Decrease Job Qualifications (% yes)	Q20E				Yes
Adopt New Technologies (% yes)	Q20F				Yes
Consider New Technologies (% yes)	Q20G				Yes

Appendix X: Benchmarking Survey Results (Part 1)

Variable	Item Number(s)	North Carolina	Ohio	Vermont	Washington
Training Department or Function Characteristics.					
Is Training Function Part of the HR? (% yes)	Q21	Yes	Yes	Yes	Yes
Is Training Director Part of the Top Management Team? (% yes)	Q35	No	No	No	No
Top Mgt. Support For Training (1-5 scale)	Ave. Q105-Q112	4.63	3.13	1.75	3.63
Interests of Training Dept. Represented In Top Mgt. Strategic Decisions.(1-5 scale)	Ave. Q67-Q72	4.33	3.5	1	2.67
Age Of Training Department (years)	2000-Q23	27	12	10	20
Number of Employees in Training Department	Q24	14	19	1	9
Ave. IRS. Training Experience of Training Dept. Employees	Q25	12	7	10	20
% Training Dept. Employees with Training Education	Q26	43	5	No	20
% Training Dept. Employees with Engineering Education	Q27	29	No	No	20
Educational Background of Training Director.					
Training or Education (% yes)	Q28A	Yes	Yes		Yes
Management, Business, or Human Resources (% yes)	Q28B	Yes	Yes		Yes
Engineering (% yes)	Q28C	No	No		No
Liberal Arts, Sciences (% yes)	Q28D	Yes	No		Yes
Training Resources.					
Training Department Budget ($)	Q36		1000000	48000	
$ Spent on Training by Divisions & Districts	Q37			50000	
Hours of Formal Training Per Employee Per Year	Q38		40	16	30
$ Spent of Formal Training Per Employee Per Year	Q39			100	
Hours of On-The-Job Training Per Employee Per Year	Q73			90	6
$ Spent of On-The-Job Training Per Employee Per Year	Q74			1500	
# New Training Programs Initiated by Training Dept. in Last Year	Q40	6	5	2	50
# New Training Programs Initiated by Districts & Divisions in Last Year	Q41		12	0	3
Change in Rate of Training Program Initiation (1-3 scale, 3=increased)	Q42	3	3	3	2
Training and Training-Related Policies and Practices.					
% of Training that is Formal (v. On-The-Job Training)	Q29		90	75	85
Extent to Which On-The-Job Training is Formalized (1-5 scale)	Ave. Q75-Q83		3.11	3.33	2.63
% Training Programs Purchased (v. Developed In-house)	Q31	No	10	75	25
Extent to Which Courses Taken Outside DOT (e.g., HI) (1-5 scale)	Q32	5	4	3	4
Extent Incept Certification Used (1-5 scale)	Q33	1	2		1
% Training Taught by Financed, Approved by Training Department	Ave. Q58-Q61	50	80	12.5	63.33
Responsibility For Training-Related Activities (1=Divisions/Districts, 5= Training De	Ave. Q62-Q66	4.2	3.4	2.8	3.2
Standardization of Formal Training (1-5 scale)	Q13	5	4	2	5
Standardization of On-The-Job Training (1-5 scale)	Q14	4	2	3	3

Appendix X: Benchmarking Survey Results (Part 1)

Variable	Item Number(s)	North Carolina	Ohio	Vermont	Washington
Training Methods.					
Extent to Which Various Training Methods Used.					
Lecture (1-5 scale)	Q43	5	4	3	1
Interactive Methods (1-5 scale)	Q45	5	4	2	4
Computer-Based Training (CBI) (1-5 scale)	Q47	4	1	1	3
% of CBI Incorporating Audio/Video	Q48				5
Existence of Policy Allowing Work Time for CBI (% yes)	Q56	Yes	No	Yes	Yes
% Employees with Access To Internet	Q57	25		90	85
Distance Learning (1-5 scale)	Q50	2	1	1	2
Networked Info Systems (1-5 scale)	Q52	2	3	3	1
Simulations (1-5 scale)	Q54	2	1	3	2
Expected Change in Use of Training Methods in Next 5 Years.					
Lecture (1-5 scale)	Q44	3	1	2	1
Interactive Methods (1-5 scale)	Q46	5	5	5	5
Computer-Based Training (CBI) (1-5 scale)	Q49	5	5	5	5
Distance Learning (1-5 scale)	Q51	5	4	4	4
Networked Info System (1-5 scale)	Q53	4	4	4	2
Simulations (1-5 scale)	Q55	3	2	3	4
Other Training Practices.					
Extent to Which Formal Training Needs Analyses are Performed (1-5 scale)	Ave. Q84-Q90	3.75	3.25	1.75	4
Training Outcome Evaluation.					
Extent to Which Different Types of Evaluations are Performed.					
Trainee Reactions (1-5 scale)	Q92	5	2	3	5
Knowledge Tests (1-5 scale)	Q93	3	3	2	4
Work Samples at the End of Training Sessions (1-5 scale)	Q94	3	3	1	2
Supervisors Evaluations Back on the Job (1-5 scale)	Q95	3	1	1	2
Self-Evaluations Back on the Job (1-5 scale)	Q96	3	2	1	1
Trainer Evaluations Back on the Job (1-5 scale)	Q97	2	2	1	1

Appendix X: Benchmarking Survey Results (Part 1)

Variable	Item Number(s)	North Carolina	Ohio	Vermont	Washington
How Training Outcome Evaluations Are Used.					
To Make Changes in Training Programs (1-5 scale)	Q98	5	5	3	5
To Make Decisions About Need to Retrain (1-5 scale)	Q99	5	2	3	1
To Evaluate the Performance of Trainers (1-5 scale)	Q100	5	4	2	4
To Determine Rewards for Trainers (1-5 scale)	Q101	5	1	1	1
To Make Decisions About Training Budget Changes (1-5 scale)	Q102	3	2	1	2
To Gain Support for Future Training Efforts (1-5 scale)	Q103	5	3	1	3
Types of Evaluation Designs Used.					
Posttest Only (% yes)	Q104A	Yes	Yes	Yes	Yes
Posttest Only with Control Group (% yes)	Q104B	No	No	No	No
Pretest-Posttest (% yes)	Q104C	Yes	Yes	No	No
Pretest-Posttest with Control Group (% yes)	Q104D	No	No	No	No
Time Series (% yes)	Q104E	Yes	No	No	Yes
No Evaluation Design (% yes)	Q104F	Yes	Yes	Yes	No
Quality of Transfer Environment.					
Rewards Given for Obtaining Training & Using Skills Learned (1-5 scale)	Ave. Q135-Q137	4	2.33	1.67	2.33
Obtaining Training & Using Skills Learned Discouraged (1-5 scale)	Ave. Q114, Q118, Q119, Q121, Q123, Q130	2.17	2.5	2.5	2.33
Supervisor Support for Obtaining Training & Using Skills Learned (1-5 scale)	Ave. Q113, Q115-Q117, Q120, Q122, Q124, Q125	4	2.8	2.3	3.2
Coworker Support for Obtaining Training & Using Skills Learned (1-5 scale)	Ave. Q128, Q129, Q131	3.67	3.33	2.33	4
Use of Skills Facilitated by Job (1-5 scale)	Ave. Q132-134	3.67	3.33	2.33	5
Training-Related Organizational Performance Outcomes.					
Adaptability of Workforce in Face of Problems, Changes, & Emergencies (1-5 scale	Ave. Q140-Q144	3.8	3.4	3.4	3.6
Flexibility of Workforce When Transferred to Jobs with Different Duties (1-5 scale)	Ave. Q146, Q148, Q150		3	3.67	4.33
% Employees Transferred in Last Year	Ave. Q145, Q147, Q149		5	4.33	8.33
Training Department Budget Spending Last Year (1=Under, 3=On, 5= Over Budget)	Q151	3	3		3
% of Training Department Projects & Plans Completed On-Time & within Budget	Ave. Q152-Q155	93.75	86.25	100	85

Appendix X: Benchmarking Survey Results (Part 1)

Variable	Item Number(s)	Wyoming	State A	State B	State C
DOT Characteristics.					
Date DOT Founded	Q2	1918	1850		1917
Number of full-time Employees	Q3	1945	22000	3200	1600
Number of Districts	Q4	5	12	7	3
Number of Divisions	Q5+Q6	34	30	8	
Standardization of DOT Practices (1-5 scale)	Ave. Q7-Q14	3.13	3	4.75	2.75
Is HR Director Part of the Top Management Team? (% yes)	Q34	No	No	Yes	No
Training-Related Environmental Characteristics.					
Right To Work State (% yes)	Q16	Yes	No	No	Yes
Extent to which State Laws Require Training (1-5 scale)	Q15	2	3	2	4
Union Support for Training (1-5 scale)	Q138		4	4	
Extent to Which Union Contracts Have Specific Training Requirements. (1-5 scale)	Q139		3	1	
Labor Market Issues.					
Extent to which new hires have needed skills (1-5 scale)	Q17	2	3	3	3
Existence of Skill Shortages in Labor Market.					
Professional Skill Shortage (% yes)	Q19A	No	Yes	No	
Managerial Skill Shortage (% yes)	Q19B	No	No	No	
Interpersonal Skill Shortage (% yes)	Q19C	Yes	Yes	No	
Clerical Skill Shortage (% yes)	Q19D	No	Yes	No	
Computer Skill Shortage (% yes)	Q19E	Yes	Yes	No	
Literacy Skill Shortage (% yes)	Q19F	No	Yes	No	
Physical Skill Shortage (% yes)	Q19G	Yes	No	No	
How DOT Addresses Skill Shortages.					
Change Recruiting Strategies (% yes)	Q20A	Yes	Yes		
"Borrow" or "Raid" from Other Areas of DOT (% yes)	Q20B	No	Yes		
Provide More Training to New Hires (% yes)	Q20C	Yes	Yes		
Increase Job Qualifications (% yes)	Q20D	No	Yes		
Decrease Job Qualifications (% yes)	Q20E	No	No		
Adopt New Technologies (% yes)	Q20F	No	Yes		
Consider New Technologies (% yes)	Q20G	No	Yes		

Appendix X: Benchmarking Survey Results (Part 1)

Variable	Item Number(s)	Wyoming	State A	State B	State C
Training Department or Function Characteristics.					
Is Training Function Part of the HR? (% yes)	Q21	No	No	No	Yes
Is Training Director Part of the Top Management Team? (% yes)	Q35	No	No	No	No
Top Mgt. Support For Training (1-5 scale)	Ave. Q105-Q112	2.5	3.38	3.57	2.5
Interests of Training Dept. Represented In Top Mgt. Strategic Decisions.(1-5 scale)	Ave. Q67-Q72	3.83	1.83	3.6	1.67
Age Of Training Department (years)	2000-Q23	4	28	26	22
Number of Employees in Training Department	Q24	3	16	10	4
Ave. IRS. Training Experience of Training Dept. Employees	Q25	13	4	10	7
% Training Dept. Employees with Training Education	Q26	33	6	0	25
% Training Dept. Employees with Engineering Education	Q27	No	0	0	0
Educational Background of Training Director.					
Training or Education (% yes)	Q28A	Yes	No	No	Yes
Management, Business, or Human Resources (% yes)	Q28B	No	Yes	Yes	No
Engineering (% yes)	Q28C	No	Yes	No	No
Liberal Arts, Sciences (% yes)	Q28D	Yes	No	No	Yes
Training Resources.					
Training Department Budget ($)	Q36	145000	2000000	500000	320000
$ Spent on Training by Divisions & Districts	Q37	1900000			0
Hours of Formal Training Per Employee Per Year	Q38	30			5
$ Spent of Formal Training Per Employee Per Year	Q39	319			
Hours of On-The-Job Training Per Employee Per Year	Q73	24	60		30
$ Spent of On-The-Job Training Per Employee Per Year	Q74	2000			
# New Training Programs Initiated by Training Dept. in Last Year	Q40	2	3	7	0
# New Training Programs Initiated by Districts & Divisions in Last Year	Q41	2	20		3
Change in Rate of Training Program Initiation (1-3 scale, 3=increased)	Q42	3	3	2	3
Training and Training-Related Policies and Practices.					
% of Training that is Formal (v. On-The-Job Training)	Q29	75	70		25
Extent to Which On-The-Job Training is Formalized (1-5 scale)	Ave. Q75-Q83	3.33	1.88	3.38	2.67
% Training Programs Purchased (v. Developed In-house)	Q31	25	60	85	80
Extent to Which Courses Taken Outside DOT (e.g., HI) (1-5 scale)	Q32	3	4	4	4
Extent Incept Certification Used (1-5 scale)	Q33	1			1
% Training Taught by Financed, Approved by Training Department	Ave. Q58-Q61	3.75	3	17.5	58.75
Responsibility For Training-Related Activities (1=Divisions/Districts, 5= Training De	Ave. Q62-Q66	1.2	1.8	2.6	3
Standardization of Formal Training (1-5 scale)	Q13	3	2	5	4
Standardization of On-The-Job Training (1-5 scale)	Q14	2	1	5	2

Appendix X: Benchmarking Survey Results (Part 1)

Variable	Item Number(s)	Wyoming	State A	State B	State C
Training Methods.					
Extent to Which Various Training Methods Used.					
Lecture (1-5 scale)	Q43	5	2	5	3
Interactive Methods (1-5 scale)	Q45	3	4	5	3
Computer-Based Training (CBI) (1-5 scale)	Q47	2	2	2	3
% of CBI Incorporating Audio/Video	Q48	100		50	20
Existence of Policy Allowing Work Time for CBI (% yes)	Q56	No	No	Yes	Yes
% Employees with Access To Internet	Q57	25	85	65	80
Distance Learning (1-5 scale)	Q50	3	2	2	2
Networked Info Systems (1-5 scale)	Q52	1	2	2	3
Simulations (1-5 scale)	Q54	1	1	3	2
Expected Change in Use of Training Methods in Next 5 Years.					
Lecture (1-5 scale)	Q44	3	3	1	2
Interactive Methods (1-5 scale)	Q46	4	4	5	2
Computer-Based Training (CBI) (1-5 scale)	Q49	4	4	4	4
Distance Learning (1-5 scale)	Q51	5	4	3	4
Networked Info System (1-5 scale)	Q53	4	4	4	4
Simulations (1-5 scale)	Q55	3	3	4	3
Other Training Practices.					
Extent to Which Formal Training Needs Analyses are Performed (1-5 scale)	Ave. Q84-Q90	2	3.88	3.5	2.88
Training Outcome Evaluation.					
Extent to Which Different Types of Evaluations are Performed.					
Trainee Reactions (1-5 scale)	Q92	4	5	5	4
Knowledge Tests (1-5 scale)	Q93	2	2	3	2
Work Samples at the End of Training Sessions (1-5 scale)	Q94	2	2	2	2
Supervisors Evaluations Back on the Job (1-5 scale)	Q95	2	2	3	1
Self-Evaluations Back on the Job (1-5 scale)	Q96	1	2	2	1
Trainer Evaluations Back on the Job (1-5 scale)	Q97	1	3	1	2

Appendix X: Benchmarking Survey Results (Part 1)

Variable	Item Number(s)	Wyoming	State A	State B	State C
How Training Outcome Evaluations Are Used.					
To Make Changes in Training Programs (1-5 scale)	Q98	2	4	4	1
To Make Decisions About Need to Retrain (1-5 scale)	Q99	2	3	2	2
To Evaluate the Performance of Trainers (1-5 scale)	Q100	1	3	3	4
To Determine Rewards for Trainers (1-5 scale)	Q101	1	1	1	1
To Make Decisions About Training Budget Changes (1-5 scale)	Q102	1	2	3	1
To Gain Support for Future Training Efforts (1-5 scale)	Q103	1	3	3	2
Types of Evaluation Designs Used.					
Posttest Only (% yes)	Q104A	Yes	Yes	Yes	Yes
Posttest Only with Control Group (% yes)	Q104B	No	No	No	No
Pretest-Posttest (% yes)	Q104C	No	Yes	Yes	No
Pretest-Posttest with Control Group (% yes)	Q104D	No	No	No	No
Time Series (% yes)	Q104E	No	Yes	Yes	Yes
No Evaluation Design (% yes)	Q104F	Yes	Yes	No	Yes
Quality of Transfer Environment.					
Rewards Given for Obtaining Training & Using Skills Learned (1-5 scale)	Ave. Q135-Q137	2.33	2	3.33	2.67
Obtaining Training & Using Skills Learned Discouraged (1-5 scale)	Ave. Q114, Q118, Q119, Q121, Q123, Q130	3.5	2.17	1.67	2.67
Supervisor Support for Obtaining Training & Using Skills Learned (1-5 scale)	Ave. Q113, Q115-Q117, Q120, Q122, Q124, Q125	2.6	3.3	3.5	3.1
Coworker Support for Obtaining Training & Using Skills Learned (1-5 scale)	Ave. Q128, Q129, Q131	2.67	3.33	3	4.33
Use of Skills Facilitated by Job (1-5 scale)	Ave. Q132-134	3.33	2.67	3	2.67
Training-Related Organizational Performance Outcomes.					
Adaptability of Workforce in Face of Problems, Changes, & Emergencies (1-5 scale	Ave. Q140-Q144	3	3.2	4.4	3
Flexibility of Workforce When Transferred to Jobs with Different Duties (1-5 scale)	Ave. Q146, Q148, Q150	4	3.33	3	3
% Employees Transferred in Last Year	Ave. Q145, Q147, Q149	4.33	3	13.33	10
Training Department Budget Spending Last Year (1=Under, 3=On, 5= Over Budget)	Q151	2	3	3	2
% of Training Department Projects & Plans Completed On-Time & within Budget	Ave. Q152-Q155	100	60	90	90

Appendix X: Benchmarking Survey Results (Part 1)

Variable	Item Number(s)	State D	State E	State F	State G	State H
DOT Characteristics.						
Date DOT Founded	Q2	1917	1801	1917	1967	1939
Number of full-time Employees	Q3	5300	5000	1000	4000	10000
Number of Districts	Q4	7	4	8	8	9
Number of Divisions	Q5+Q6	28	33	9	12	39
Standardization of DOT Practices (1-5 scale)	Ave. Q7-Q14	3	4.13	3.43	4.25	3.63
Is HR Director Part of the Top Management Team? (% yes)	Q34	No	Yes	Yes	Yes	Yes
Training-Related Environmental Characteristics.						
Right To Work State (% yes)	Q16	No	Yes	Yes		Yes
Extent to which State Laws Require Training (1-5 scale)	Q15	2	3	2	3	3
Union Support for Training (1-5 scale)	Q138				5	
Extent to Which Union Contracts Have Specific Training Requirements. (1-5 scale)	Q139					
Labor Market Issues.						
Extent to which new hires have needed skills (1-5 scale)	Q17	3	2	4	4	4
Existence of Skill Shortages in Labor Market.						
Professional Skill Shortage (% yes)	Q19A	Yes	Yes	Yes	No	Yes
Managerial Skill Shortage (% yes)	Q19B	No	Yes	No	No	No
Interpersonal Skill Shortage (% yes)	Q19C	Yes	Yes	No	No	No
Clerical Skill Shortage (% yes)	Q19D	No	Yes	No	No	No
Computer Skill Shortage (% yes)	Q19E	Yes	Yes	Yes	No	Yes
Literacy Skill Shortage (% yes)	Q19F	No	No	No	No	No
Physical Skill Shortage (% yes)	Q19G	No	No	No	No	No
How DOT Addresses Skill Shortages.						
Change Recruiting Strategies (% yes)	Q20A	Yes	Yes	Yes	No	Yes
"Borrow" or "Raid" from Other Areas of DOT (% yes)	Q20B	No	Yes	Yes	No	Yes
Provide More Training to New Hires (% yes)	Q20C	Yes	Yes	No	No	Yes
Increase Job Qualifications (% yes)	Q20D	Yes	No	No	No	No
Decrease Job Qualifications (% yes)	Q20E	No	No	Yes	No	No
Adopt New Technologies (% yes)	Q20F	Yes	Yes	No	No	Yes
Consider New Technologies (% yes)	Q20G	Yes	No	No	No	Yes

Appendix X: Benchmarking Survey Results (Part 1)

Variable	Item Number(s)	State D	State E	State F	State G	State H
Training Department or Function Characteristics.						
Is Training Function Part of the HR? (% yes)	Q21	No	Yes	Yes	Yes	Yes
Is Training Director Part of the Top Management Team? (% yes)	Q35	No	No	No	No	No
Top Mgt. Support For Training (1-5 scale)	Ave. Q105-Q112	3.13	2.38	4.25	3.88	3.63
Interests of Training Dept. Represented In Top Mgt. Strategic Decisions.(1-5 scale)	Ave. Q67-Q72	3.33	3.33	3.17	3.33	3.83
Age Of Training Department (years)	2000-Q23	15	38	10	33	30
Number of Employees in Training Department	Q24	6	10	2	4	13
Ave. IRS. Training Experience of Training Dept. Employees	Q25	7	15	No	15	15
% Training Dept. Employees with Training Education	Q26	15	15	No	25	40
% Training Dept. Employees with Engineering Education	Q27	No	No	No	No	No
Educational Background of Training Director.						
Training or Education (% yes)	Q28A	Yes	Yes	No	No	No
Management, Business, or Human Resources (% yes)	Q28B	No	No	Yes	No	Yes
Engineering (% yes)	Q28C	No	No	No	No	No
Liberal Arts, Sciences (% yes)	Q28D	No	No	No	Yes	No
Training Resources.						
Training Department Budget ($)	Q36	360000	1000000	159000	1900000	1200000
$ Spent on Training by Divisions & Districts	Q37			0		1000000
Hours of Formal Training Per Employee Per Year	Q38	10	6.5	40	48	40
$ Spent of Formal Training Per Employee Per Year	Q39		125	106		240
Hours of On-The-Job Training Per Employee Per Year	Q73					80
$ Spent of On-The-Job Training Per Employee Per Year	Q74					132
# New Training Programs Initiated by Training Dept. in Last Year	Q40	3	1	3	5	2
# New Training Programs Initiated by Districts & Divisions in Last Year	Q41			4		1
Change in Rate of Training Program Initiation (1-3 scale, 3=increased)	Q42	2	3	3	3	3
Training and Training-Related Policies and Practices.						
% of Training that is Formal (v. On-The-Job Training)	Q29	50	25	100	33	40
Extent to Which On-The-Job Training is Formalized (1-5 scale)	Ave. Q75-Q83	3	2.44	1.4	2.56	2.89
% Training Programs Purchased (v. Developed In-house)	Q31	95	75	100	25	85
Extent to Which Courses Taken Outside DOT (e.g., HI) (1-5 scale)	Q32	2	2	4	4	2
Extent Incept Certification Used (1-5 scale)	Q33	3		3		2
% Training Taught by Financed, Approved by Training Department	Ave. Q58-Q61	62.5	80.25	75	18.75	45
Responsibility For Training-Related Activities (1=Divisions/Districts, 5= Training De	Ave. Q62-Q66	3.4	3.4	3	3.2	2.8
Standardization of Formal Training (1-5 scale)	Q13	4	5	4	4	4
Standardization of On-The-Job Training (1-5 scale)	Q14	3	3	3	4	3

Appendix X: Benchmarking Survey Results (Part 1)

Variable	Item Number(s)	State D	State E	State F	State G	State H
Training Methods.						
Extent to Which Various Training Methods Used.						
Lecture (1-5 scale)	Q43	3	1	2	2	2
Interactive Methods (1-5 scale)	Q45	4	5	3	4	4
Computer-Based Training (CBI) (1-5 scale)	Q47	2	2	3	2	2
% of CBI Incorporating Audio/Video	Q48		100			10
Existence of Policy Allowing Work Time for CBI (% yes)	Q56	No	Yes	Yes	Yes	Yes
% Employees with Access To Internet	Q57	30	55	80	95	40
Distance Learning (1-5 scale)	Q50	2	2	5	2	2
Networked Info Systems (1-5 scale)	Q52	2	2	1	2	2
Simulations (1-5 scale)	Q54	2	2	3	2	1
Expected Change in Use of Training Methods in Next 5 Years.						
Lecture (1-5 scale)	Q44	3	3	1	2	2
Interactive Methods (1-5 scale)	Q46	5	3	3	4	4
Computer-Based Training (CBI) (1-5 scale)	Q49	5	5	5	4	4
Distance Learning (1-5 scale)	Q51	3	5	5	4	4
Networked Info System (1-5 scale)	Q53	5	4		3	4
Simulations (1-5 scale)	Q55	3	4	4	4	4
Other Training Practices.						
Extent to Which Formal Training Needs Analyses are Performed (1-5 scale)	Ave. Q84-Q90	2.75	2.25	2.88	3.5	3.13
Training Outcome Evaluation.						
Extent to Which Different Types of Evaluations are Performed.						
Trainee Reactions (1-5 scale)	Q92	4	4	5	5	4
Knowledge Tests (1-5 scale)	Q93	2	2	3	2	3
Work Samples at the End of Training Sessions (1-5 scale)	Q94	2	1	3	2	2
Supervisors Evaluations Back on the Job (1-5 scale)	Q95	3	1	5	2	2
Self-Evaluations Back on the Job (1-5 scale)	Q96	3	2	5	3	3
Trainer Evaluations Back on the Job (1-5 scale)	Q97	3	3	2	5	2

Appendix X: Benchmarking Survey Results (Part 1)

Variable	Item Number(s)	State D	State E	State F	State G	State H
How Training Outcome Evaluations Are Used.						
To Make Changes in Training Programs (1-5 scale)	Q98	4	3	4	5	3
To Make Decisions About Need to Retrain (1-5 scale)	Q99	2	2	4	3	3
To Evaluate the Performance of Trainers (1-5 scale)	Q100	4	4	5	4	2
To Determine Rewards for Trainers (1-5 scale)	Q101	3	1	3	1	2
To Make Decisions About Training Budget Changes (1-5 scale)	Q102	3	2	3	2	3
To Gain Support for Future Training Efforts (1-5 scale)	Q103	3	2	5	4	3
Types of Evaluation Designs Used.						
Posttest Only (% yes)	Q104A	No	No	Yes	No	Yes
Posttest Only with Control Group (% yes)	Q104B	No	Yes	No	No	No
Pretest-Posttest (% yes)	Q104C	No	No	No	Yes	Yes
Pretest-Posttest with Control Group (% yes)	Q104D	No	No	No	No	No
Time Series (% yes)	Q104E	Yes	No	Yes	No	Yes
No Evaluation Design (% yes)	Q104F	No	No	No	No	Yes
Quality of Transfer Environment.						
Rewards Given for Obtaining Training & Using Skills Learned (1-5 scale)	Ave. Q135-Q137	2.67	2.33	4	1.33	3.33
Obtaining Training & Using Skills Learned Discouraged (1-5 scale)	Ave. Q114, Q118, Q119, Q121, Q123, Q130	2.67	3.17	1.33	1.83	2.83
Supervisor Support for Obtaining Training & Using Skills Learned (1-5 scale)	Ave. Q113, Q115-Q117, Q120, Q122, Q124, Q125	3.2	3.7	3.9	4	2.6
Coworker Support for Obtaining Training & Using Skills Learned (1-5 scale)	Ave. Q128, Q129, Q131	3.67	3.33	3.67	4	4
Use of Skills Facilitated by Job (1-5 scale)	Ave. Q132-134	4	3.33	3.67	3.33	4
Training-Related Organizational Performance Outcomes.						
Adaptability of Workforce in Face of Problems, Changes, & Emergencies (1-5 scale	Ave. Q140-Q144	2.6	3	3.8	3.8	4
Flexibility of Workforce When Transferred to Jobs with Different Duties (1-5 scale)	Ave. Q146, Q148, Q150	3	3.33	4	3	3.67
% Employees Transferred in Last Year	Ave. Q145, Q147, Q149		10			10
Training Department Budget Spending Last Year (1=Under, 3=On, 5= Over Budget)	Q151	3	3	3	3	3
% of Training Department Projects & Plans Completed On-Time & within Budget	Ave. Q152-Q155	92.5	86.25	97	87.5	61.25