

Tools to Aid State DOTs in Responding to Workforce Challenges

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NCHRP REPORT 636

**Tools to Aid State DOTs
in Responding to
Workforce Challenges**

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NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

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FOREWORD

By **Andrew C. Lemer**

Staff Officer

Transportation Research Board

This report is a guide to the selection of practical tools that officials of state departments of transportation (DOTs) can use in recruitment, development, and retention of a productive and effective workforce. DOTs need to hire, train, and keep a competent, qualified, and high-performing workforce to do the job the public expects them to do. This report describes currently available tools for responsible managers to use and provides guidance for how to choose an effective tool for the task at hand. The information will be useful to human resources personnel and DOT managers responsible for ensuring that their agencies have the workforce they need.

DOTs face ongoing, evolving challenges to maintaining their ability to fulfill their responsibilities to the public. Budgetary pressures, policy mandates, changes in the workforce, and introductions of new technology are among the factors that require DOT leadership to reassess and sometimes reshape their organizations' mission and structure. Managers must then ensure their human resources (HR) assets can respond effectively to the changes. DOTs seeking to build and maintain competent, skilled workforces need time, skills, money, and other resources that often are in short supply.

For example, DOTs face demands that require new and greater technical and management skills and capabilities. At the same time, recruiting and retaining personnel have grown more difficult, as DOTs must compete for the same workforce used by local government and private organizations. If an agency's staff is unable to meet all responsibilities, outside service providers may supplement agency staff capabilities. DOT leaders and managers must decide how HR assets are to be acquired and deployed, and they often seek tools and examples from other agencies that will help them make and implement their decisions.

This report is the product of National Cooperative Highway Research Program (NCHRP) Project 20-72, intended to assist agencies in assuring that their personnel have the capabilities needed to meet the agencies' critical mission requirements 5 to 10 years into the future. The specific objective of this project was to provide a guide to finding, selecting, and applying practical management tools for characterizing and assessing HR assets. These tools address, for example, personnel core competencies, preservation of institutional history and other mission-critical knowledge, staff recruitment and retention, staff development, and management succession.

The report presents specific information on tools that are currently available, how to apply them, and guidance for judging whether available resources are likely to be useful for specific situations. Much of the information and links to specific resources are presented in a prototype web-based "Workforce Toolkit" developed as part of the research and populated with over 200 sample resources. The Toolkit is designed with five views linked to

tagged databases of resources. The toolkit includes tables containing state-specific DOT information from recently completed NCHRP projects. Additional views are designed to connect to online communities and education materials. The site also has an electronic user guide.

The demonstration prototype, available on a web site currently maintained by the research team, could become the basis for a permanent web application maintained by AASHTO or others. Adding new tools as they become available and discarding those that become obsolete would ensure the Toolkit's currency and maintain its value. Individual states may find the prototype useful for the information it now contains and as a basis for development their own toolkits.

A team led by Spy Pond Partners, LLC, Arlington, Massachusetts, conducted this research and developed the prototype. The project entailed a review of available literature, current practices, and other sources of information to identify tools and methods usable by DOT managers to deal with key workforce challenges. The research assessed the adequacy and value of existing tools for dealing with workforce challenges facing DOTs now and 5 to 10 years into the future, identified the tools most likely to be of value to DOT managers, documented gaps for which new tools may be needed, and suggested activities to fill these gaps. The research team then designed a framework to help DOT managers identify tools appropriate for use within their unique environments and used that framework to structure the guide and create the demonstration web site detailed in this report.



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Tools to Aid State DOTs in Responding to Workforce Challenges

State Departments of Transportation (DOTs) face a number of workforce-related challenges that significantly impact their ability to deliver services in an efficient and effective manner. As experienced employees retire and resources tighten, DOTs need to become more strategic about workforce planning and pursue new approaches to recruitment, succession planning, training, and organizational restructuring. Several NCHRP projects have been conducted over the past few years on topics related to workforce management at DOTs, and there is a wealth of other relevant information resources available—case studies, methodologies, guides, software applications—that agencies can draw upon. These existing resources can help DOTs understand how their peers are addressing similar issues, discover successful practices, and provide models that may be adapted for a fraction of the cost of what would have been required to design and develop a new program or initiative. However, DOTs are not necessarily aware of what resources exist and may not be able to easily identify information resources that would be helpful to them. The objective of NCHRP Project 20-72 is to articulate key current and emerging DOT workforce needs and link these needs to available resources.

In the initial phase of the project, the research team reviewed and assessed current literature, web sites, and practices to identify resources of relevance and value in addressing DOT workforce challenges and developed an organizing framework for the information. In the final phase, a prototype web site was developed that provides access to relevant information resources.

Phase I included the following activities:

- Review of literature and practice to identify resources most useful in addressing DOT workforce challenges.
- Assessment of the adequacy and value of existing resources to addressing DOT workforce challenges. This task included a gap assessment of resources available for responding to current and emerging workforce challenges.
- Development of an organizing framework for providing access to relevant information resources.

In Phase II, a prototype web site called the “Workforce Toolkit” was developed. Several requirements were identified for the workforce toolkit.

- First, the information resources in the toolkit would need to be dynamic rather than static, i.e., there would need to be a mechanism to add new resources as they became available and eliminate old resources that were no longer relevant.
- Second, the toolkit should accommodate a diverse set of workforce-related topics to meet the needs of multiple agencies, each with their own workforce challenges and business processes.

- Third, the Toolkit should be useable by different types of users with varying information needs and search styles. These requirements led to the development of a flexible and extensible tool for information access. The framework developed in Phase I defined the scope of resources to be included in the Toolkit and established and defined categories to be used to match information resources to workforce needs faced by state DOTs. Categories were further defined by type of resource and audience for the resource. The framework has been designed so that this set of categories can be adapted over time.

As the Toolkit evolves, new resources, search views, and search parameters can be added. The Toolkit currently offers the following views:

- Top Ten DOT Workforce Needs—links the most common workforce needs to resources that address those needs.
- Frequently Asked Questions—links questions that DOT managers might ask to resources to answer those questions (i.e., the number one FAQ currently may be related to reduction in force).
- Functional View of Workforce Needs—links a hierarchical list of DOT human resources functions to relevant resources and provides definitions of each function.
- Faceted Search for Workforce Resources—allows users to search resources based on individually selected parameters within need type, audience, source, DOT role, and resource type.
- Geographic View—allows state DOT personnel to locate information from peer agencies.
- Text Search—allows users to enter search keywords.
- State Practices—links to tables generated from recently completed NCHRP projects that include workforce-related surveys of state DOTs. It provides state DOT personnel a snapshot view of peer agency practices.
- Forum—links to the FHWA web site and can be used to provide additional views containing information on workforce-related conferences, discussion forums on specific topics of interest, performance benchmarking, etc. This link is included to suggest that a forum can be established for the community of professionals interested in state DOT workforce issues.
- Video—links to the AASHTO YouTube site. This link is included to suggest that videos are a type of resource that can be captured and made accessible to the Toolkit users.

The second phase of the project also included development of a Workforce Toolkit Administration site to be used to add, delete, or edit resources for the public Workforce Toolkit site. The research team anticipates that AASHTO will be the steward of the Toolkit after the completion of this project and will be responsible for the administration of the site.

This report concludes with recommendations for continuing the work begun in NCHRP Project 20-72. The recommendations include suggestions for converting the working prototype of the Workforce Toolkit to a full-scale version with enhanced capabilities.



PART A

A New Tool for Meeting Workforce Challenges

Introduction

1.1 Research Objectives

The objective of the National Cooperative Highway Research Program (NCHRP) Project 20-72 was to “produce a guide to selection and application of practical management tools that state DOT leadership, managers, and HR staff can use to address workforce challenges in the following areas:

- Characterizing and assessing core competencies of the agency’s personnel, which are likely to be influenced by changing demographics, staff turnover, attrition, and competition from other employers.
- Characterizing and assessing the need to preserve institutional history and other mission-critical knowledge held by current personnel.
- Recruiting diverse staff to ensure needed competencies are in place to meet future demands.
- Educating, training, and developing staff to attain needed competencies, institutional history, and other mission-critical knowledge.
- Succession planning to ensure availability of highly competent and qualified personnel to fill key management and leadership roles at all levels of the organization.
- Retaining staff to maintain productivity.
- Ensuring an adequate and diverse supply of qualified entry-level personnel to meet mission-critical requirements in the future.”

The research objective recognized the wide range of goals and activities that are necessary for successful workforce management. It also recognized the existence of numerous useful management methodologies and resources available in the marketplace and the need for a practical guide for DOTs to match available resources to specific needs.

The recent research projects that have explored these issues address a variety of strategies for recruitment, retention, succession planning, training, and change management. In addition to research reports available from the Transportation Research Board (TRB) and the Federal Highway Administration (FHWA), there are web sites for peer exchange of information related to workforce challenges, resources available from organizations outside of the transportation sector on techniques to improve government agency management, and a wide range of methodologies and tools developed by private companies. However, there is no integrated tool available to state DOTs for matching workforce-related needs to available and appropriate resources.

Because a static guide would quickly become outdated, the research team elected to fulfill this objective by building a Web-based resource that DOT managers can easily use to meet workforce challenges. Specific challenges involved (1) targeting the content of the toolkit to the needs that DOT managers are (and will be) facing and (2) organizing the toolkit so that users can easily find relevant resources and determine applicability of a given resource to their particular situation.

1.2 Study Context

State DOTs face ongoing and evolving challenges of doing the job that the public expects of them. Many forces, including legislative requirements, reduced financial capacity, and technology advances are requiring DOTs to re-examine their mission and role. Changes in mission and role have important implications for workforce requirements. For example, DOTs that are pursuing flatter organizational structures that push greater responsibility to field offices require a larger pool of field personnel with technical, leadership, and customer service skills, as well as mechanisms at the central office to effectively provide management and support to the field. DOTs that are moving toward greater outsourcing of maintenance and design require stronger contract development, negotiation, and oversight capabilities. DOTs that are aggressively pursuing operational improvements to make best use of available capacity need staff that can plan for and manage increasingly sophisticated technology. They also require shifts in organizational culture given the traditional plan-design-build orientation of the DOT. Increased emphasis on partnerships across state, regional and local agencies means that DOTs need staff with top-notch negotiation and communication skills and the ability to work effectively in the networked environment these partnerships require.

At the same time as workforce requirements are shifting, economic upheaval is causing major changes in the size and composition of the DOT workforce. Historically DOT employees stayed with the organization for their entire careers. This is not likely to be the case for the 21st century. DOTs will face stiffer competition from the private and academic sectors while simultaneously being confronted with a shrinking pool of qualified transportation professionals. Interest in engineering programs at colleges and universities has continued to decline, which means the historical feeder pipeline into DOTs has been declining. In a study conducted by Karen Philbrick and Patrick Sherry of the University of Denver in 2004, only 18% of college students said they would consider transportation careers. When students were given a list of 14 careers to choose from, only 2.6% expressed interest in transportation.

1.2.1 Resources for Success

To be successful, DOTs must have a broad set of resources to assess, diagnose, and address workforce issues. These resources must be helpful at both strategic and operational levels. In addition, the organizational infrastructure for implementation and use of these resources must be explicitly planned for and provided.

Strategic Resources. DOT management need guidance on how to assemble a holistic approach to building the workforce they need to fulfill their mission—getting the right people in the right jobs at the right time, while simultaneously, if required, letting go of the right people without negatively affecting services or mission. Resources are needed to develop and use performance metrics to track progress, pinpoint areas for improvement, and support benchmarking against peer agencies; for strategic assessment of current and likely future gaps in the workforce (skills, experience, diversity); and for review of current policies, programs, and procedures that impact workforce composition and capabilities. Once the gaps are identified, easy access to successful models utilized in other organizations can be invaluable for developing an effective plan of action.

Operational Resources. At the operational level, a need exists for practical resources for both information gathering and program implementation. Information gathering tools include those for tracking key statistics from human resources systems on recruitment and retention, as well as specialized survey instruments for competency assessment, exit interviews, employee satisfaction monitoring, and applicant debriefs on the recruiting process. Implementation resources span a wide range of functions—recruitment, employee performance reviews, supervisor training, employee orientation, in-service training, employee mentoring, and career counseling, benefits program design, incentive and advancement programs, succession planning, and knowledge management.

Organizational Models for Tool Application. In addition to providing a toolkit to access available resources, a mechanism is needed to explicitly identify the audience(s) within the DOT for each resource and to suggest realistic approaches for how they would be applied. One issue to be addressed is that relatively few DOTs have involved their human resources functions at the strategic level of decision making. The human resources function is often focused on administrative and compliance-related tasks. This may be a key factor limiting DOTs' potential to develop and implement truly effective workforce strategies that have strong linkages with operational program components. Integrating human resources functions into strategic decision making is particularly critical during reductions in force, when ensuring optimal results from a streamlined organization is crucial. Therefore, resources were identified and documented that provide organizational models involving human resources as a more strategic player in the DOT, and describe kinds of human resources competencies and internal partnerships that are required to make these models successful.

1.2.2 Targeting Needs

While some common trends impact workforce concerns across the entire DOT (outsourcing, downsizing, decentralizing, retirements, turnover, and mismatch of skills to needs), the research team believes the impact of the toolkit is maximized by designing it to address the needs and responsibilities of specific users within the DOT. Therefore, they began the project by defining audiences or user classes for the toolkit and identifying both the key concerns of each class and the activities that are within their purview to effect change. For the prototype included with this report, the perspectives of top agency executives (CEOs), senior managers (division chiefs and district administrators), human resources managers, and line managers/workgroup supervisors were considered.

The next step involved matching available resources to needs and target audiences. There is a diverse set of resources—documented methodologies or models, survey instruments, case studies, policies and procedures, organizational models, and software—that may be helpful to DOTs seeking to address workforce challenges. The team identified the key challenges of each class and defined these as workforce needs. The need types currently included in the Workforce Toolkit are strategic planning, organizational development, human resources information systems, retention, compensation and benefits, downsizing/reductions in force, retirement, workforce planning and development, organizational change, leadership development, human resources planning, organizational performance, human resources function, employee conflict, competencies, recruitment, succession planning, outsourcing/contract management, training and development, knowledge management, and performance management. These needs are defined in section 2.3.1.

The Workforce Toolkit links these needs to the relevant audience and to the appropriate resources. This approach reinforces a holistic approach to addressing workforce issues while providing an easily understood topical organization of the resources.

1.2.3 Recent Research

A wide body of research was used to develop this tool. Listed below are the key NCHRP sources reviewed for this project.

- NCHRP Project 20-24(40), “Analysis and Benchmarking of State DOT Recruitment and Hiring Practices.”
- NCHRP Project 20-24(48), “Analysis and Benchmarking of State DOT Human Resource Activities.”
- NCHRP Project 20-24(50), “In-Service Training Needs for State DOTs.”
- *TRB Special Report 275: The Workforce Challenge.*

- NCHRP Project 20-24 (14), “Managing Change In State Departments of Transportation.”
- *NCHRP Synthesis 323: Recruiting and Retaining Individuals in State Transportation Agencies.*
- *NCHRP Synthesis 349: Developing Transportation Agency Leaders: A Synthesis of Highway Practice.*
- *NCHRP Synthesis 362: Training Programs, Policies, and Practices.*

In addition to these NCHRP/TRB resources, an extensive literature review was conducted on workforce issues from FHWA, AASHTO, the National Academy of Public Administration, the Government Accountability Office, CPS Human Resource Services, the National Association of State Personnel Executives, the International Public Management Association, the IBM Center for the Business of Government, the Partnership for Public Service and others. A full review of existing resources is available in Chapter 6.

1.3 Overview of Research Approach

The initial 6-month phase of the research effort reviewed the literature and practices related to workforce challenges; identified, prioritized, and recommended a set of resources for inclusion in the Toolkit; and developed an organizing framework for the Toolkit. The specific tasks for this phase included:

Task 1—Review of Literature and Practice. This task comprised a review of research and materials available from the transportation field, public sector, professional organizations and trade associations, academia, the military, the private sector and labor unions, and then identifying and applying those that can be utilized by DOTs to meet current and future workforce challenges. The review emphasized DOT-specific organizational and workforce research including NCHRP studies, DOT model programs such as those posted on the FHWA web site, and successful practices from organizations such as the National Academy of Public Administration (NAPA), the American Society for Training and Development (ASTD), the Society for Human Resources Management (SHRM), and the Conference Board.

Task 2—Existing Resources Evaluation and Assessment. The purpose of this task was to assess the adequacy and value of current resources to address current and likely future DOT workforce challenges. This allowed the research team to identify resources which were strong candidates for inclusion in the Toolkit. It also allowed for the identification of gaps or areas where there are unmet needs for resources. As part of this task, the team compiled a list of available resources organized by workforce need and type of resource. Additionally, they developed a list of key workforce needs to be addressed over the next 5–10 years. The list is based on an analysis of general issues and trends and how they impact workforce needs, as well as an analysis of the particular needs of specific DOT user groups.

Task 3—Toolkit Framework. Developing a framework for the tool began with the recognition that it must be flexible and dynamic to meet the differing needs of state DOTs and the variable nature of those needs. Rather than creating a static guide, which would become quickly outdated, the research team focused their efforts on a Web-based tool that allowed varied approaches to searching resources, that streamlined the matching of needs to resources, and that could be easily expanded and updated.

Task 4—Phase 1 Interim Report. In addition to drafting a report of progress to date, the research team met with the panel to discuss comments. In response to this feedback, the research team created a database to collect and keep resources and decided to continue adding relevant resources to the database throughout the duration of the project. This approach was used to enable the entity that ultimately becomes the Toolkit’s steward to continue updating and populating the database with useful resource information. Once panel approval was obtained,

the team proceeded with Phase 2, a 17-month effort to develop the Toolkit. This phase focused on identification of additional resources to fill gaps identified in Phase 1, classifying the resources to be included in the Toolkit, building and testing the Toolkit, and documenting the research effort.

Task 5—Workforce Resources Database. During this phase, the research team and research panel continued adding resources to the database. A set of standard resource descriptions was developed, including the following:

- Detailed descriptions oriented toward a DOT audience.
- Identification of the type of resource (methodology or model, measurement or assessment tool, case study, policy or procedure, organization, software application, consulting service).
- Identification of the source of the information (TRB/NCHRP/TCRP, journal or publisher, NAPA, USDOT, state DOT, other state agency, university research center, national association—transportation, national association—public administration, national association—human resources).
- Identification of the intended audience for the resource (state DOT, transportation professionals, public sector, private sector, human resources, training and development).

Task 6—Develop Toolkit. The team designed and developed an electronic, hyperlinked site that includes a Web portal for easy access to documents or resources that will be of additional use in addressing workforce challenges within state DOTs. The Workforce Toolkit was built within the following parameters:

- Intended scope and audience: The Toolkit is intended to respond to workforce challenges faced by high-level and mid-level managers within a transportation agency.
- The Toolkit emphasizes basic, practical approaches to applying resources to different situations and to responding to unforeseen or changed circumstances. It is not meant to provide specific solutions to problems.
- The Toolkit is designed to account for basic differences in agency organizational and institutional settings and to provide alternate approaches for agencies to use where appropriate. It is intended to inform management decision making, not supersede it.
- To accommodate the skills and needs of different users in a variety of settings, the research team decided to make database information accessible through a variety of views. Five of these views—Top Ten DOT Needs, Frequently Asked Questions, Functional View, Faceted Search, and Text Search—are linked to the database containing resources summarized in Table 6.1. The other views contained in the Workforce Toolkit are explained in Chapter 2.

Task 7—Final Report.



CHAPTER 2

Workforce Toolkit

2.1 Overview

The challenge of this project was to build a flexible, user-friendly tool that encompassed a wide variety of subjects while focusing on common workforce issues experienced by DOTs. Because the tool needed to be publicly available and easily updated, the researchers chose to develop a Web-based knowledge portal with 10 views. These views accommodate diverse searches to make accessing information intuitive for a wide range of users in a variety of workplace settings and scenarios. The site connects users to external sites where additional resources are available.

Following an extensive search of available literature to identify resources of interest, the research team assembled a database of over 200 resources. These resources were linked to search features, or facets, to ensure that the most relevant resources were retrieved for each search. A “facet” is a dimension on which a subject may be classified—for example, a vacation can be classified based on destination, cost, length of time, and suitability for families. Similarly, a workforce information resource can be classified based on topic area, source, or target audience. Using a companion administration site, which is password protected, additional resources can be added to the database, search parameters can be modified, or outdated resources can be deleted.

These resources are not intended to provide exhaustive coverage of workforce issues. They do however include the most directly relevant resources for state DOTs. The research panel at the end of Phase 1 directed the research team to focus Phase 2 efforts on developing the software capabilities of the Toolkit rather than expanding the breadth of resources. The panel felt that the AASHTO Subcommittee on Human Resources would be able to add to the resource base after the project was completed.

The Workforce Toolkit is located at: <http://146.115.18.166/Workforce10a/NCHRP.aspx>.

The web site was developed as part of the work under NCHRP Project 20-72. The site is being provided as a demonstration by the research team. At the completion of the research project and publication of this report, discussions were continuing among AASHTO, NCHRP, the research team and others, regarding the long-term maintenance of the web site and the Workforce Toolkit but no firm plans had been developed.

2.2 Accessing Information

This toolkit provides nine options for finding resources. Five of the views access a database containing resources selected from web sites, books, publications, university research centers, state DOT practices, and other educational resources selected for their usefulness and relevancy. Two options, Geographic View and State Practices, link to separate databases containing responses to surveys, statistical data or contact information. Resource searches cannot be performed from

these views. This is a capability that the research team suggests be developed in the future. Additional options include a full text search (of resource abstracts), access to the FHWA Community of Practice forum, and access to the AASHTO YouTube site.

Each of the Toolkit's views is briefly described in the following sections.

View 1 in Figure 2.1 accesses resources relevant to needs identified by the research team as priority issues facing DOT workforce managers. The needs are displayed as row names in the table, and the column heads further define what the DOT needs to know about these areas: (A) understand issues and trends; (B) learn about peer agencies; (C) assess our situation; or (D) implement programs, policies, and procedures. Each topic is explained in an overview, and available resources are retrieved by clicking the blue "resource list" link. The initial information retrieved includes a short description of the resource. Clicking on a title retrieves detailed information, including author, organization, contract information, and URL.

The top 10 issues, which were identified by the research team and reviewed by the research panel are the following:

- Strategic workforce planning,
- Attracting and retaining talent,
- Developing the next generation of leaders,
- Downsizing and reduction in force,
- Employee conflicts and performance issues,
- Improving HR efficiency and effectiveness,
- Outsourcing,
- Organizational change—reengineering and reorganizing,
- Preserving institutional knowledge, and
- Retooling the workforce to meet evolving business needs.

The view allows for a further refining of the search by combining the priority issues with needs. The needs, which appear as column headers, are: understand issues and trends; learn about peer

The screenshot shows the NCHRP Workforce Toolkit interface. At the top, there is a navigation bar with the title "NCHRP Workforce Toolkit" and a "Contact Us" button. Below the navigation bar, there is a breadcrumb trail: "Home > Top Ten DOT Needs". The main content area is titled "Top Ten DOT Workforce Needs" and includes the sub-header "I am seeking resources to help me". A table is displayed with the following structure:

My organization needs to address	A. Understand issues and trends	B. Learn about peer agencies	C. Assess our situation	D. Implement programs, policies, procedures
1. Strategic workforce planning	Overview Resource list	Overview Resource list	Overview Resource list	Overview Resource list
2. Attracting and retaining talent	Overview Resource list	Overview Resource list	Overview Resource list	Overview Resource list
3. Retooling the workforce to meet evolving business needs	Overview Resource list	Overview Resource list	Overview Resource list	Overview Resource list
4. Grooming the next	Overview	Overview	Overview	Overview

On the left side of the interface, there is a vertical navigation menu with the following items: "Top Ten DOT Needs", "FAQ", "Functional View", "Faceted Search", "Geographic View", "Text Search", "State Practices", "Home", "Forum", and "Video".

Figure 2.1. View 1—Top ten DOT workforce needs.

agencies; assess our situation; and implement programs, policies, and procedures. Selecting “resource list” from the desired column and row retrieves relevant information from the database that is relevant to the selected topic (row) and would be useful to address the specific need (column.) For example, the resources listed in 1B accesses information on how peer agencies are approaching strategic workforce planning.

The Frequently Asked Questions (FAQ) view in Figure 2.2 lists the questions identified by the research team as addressing priority issues for state DOTs, including inquiries regarding retirement, recruitment, turnover, downsizing, reorganizing, performance metrics, strategic planning, outsourcing, and data management resources. Clicking on a question retrieves an alphabetical list of relevant resources by title, as well as a short description of each resource. Clicking on the work’s title leads to additional information, including a link to the source document and contact information (if available). FAQs can be edited or updated as workforce priorities evolve.

Currently the questions are the following:

- What resources are available to help me with reductions in force?
- A large percentage of our organization’s workforce is due to retire over the next five years. How can we address this situation?
- We are having a tough time filling open positions for engineers, and can’t match consultant salaries. How can we find and attract good engineers?
- There is a large gap in experience between our service managers and engineers and the next tier of staff. How do we fill that gap before the senior folks all retire?
- Our turnover rates are increasing, especially in our urban districts. How can we deal with this?
- We have a key career manager planning to retire in two years. How can we make sure there is a smooth transition to a new person?
- We are about to go through downsizing of our field units. How do we make the transition as smooth as possible?

NCHRP Workforce Toolkit [Contact Us](#)

[Home](#) > [Frequently Asked Questions](#)

FAQ

- [1. What resources are available to help me with reductions in force?](#)
- [2. A large percentage of our organization’s workforce is due to retire over the next five years. How can we address this situation?](#)
- [3. We are having a tough time filling open positions for engineers, and can’t match consultant salaries. How can we find and attract good engineers?](#)
- [4. There is a large gap in experience between our senior managers and engineers and the next tier of staff. How do we fill that gap before the senior folks all retire?](#)
- [5. Our turnover rates are increasing, especially in our urban districts. How can we deal with this?](#)
- [6. We have a key career manager planning to retire in two years. How can we make sure there is a smooth transition to a new person?](#)
- [7. We are about to go through downsizing of our field units. How do we make this transition as smooth as possible?](#)
- [8. We have several “problem” managers who need to build their supervisory skills. What resources are available for us to draw upon?](#)
- [9. After many years of stability, we have undergone several reorganizations in the past two years. Morale is low and there is confusion about roles and responsibilities. How do we get on a better track?](#)
- [10. Our mission has shifted and we are relying more on outsourced services. Our staff capabilities do not match our needs for good collaboration, oversight and negotiation skills. What is the most efficient way to address this mismatch?](#)

Figure 2.2. View 2—Frequently asked questions.

- We have several “problem” managers who need to build their supervisory skills. What resources are available for us to draw upon?
- After many years of stability, we have undergone several reorganizations in the past two years. Morale is low and there is confusion about roles and responsibilities. How do we get on a better track?
- Our mission has shifted and we are relying more on outsourced services. Our staff capabilities do not match our needs for good collaboration, oversight, and negotiation skills. What is the most efficient way to address this mismatch?
- We need to improve our ability to measure the performance of our HR function and benchmark it against other agencies. What are there to help us get started?
- We need to replace our ancient Human Resources Information System (HRIS). How can we learn about new products and their capabilities? How do we influence when a statewide decision is being made by the state HR group? How do we implement a new HRIS and still have access to legacy data?
- Our HR function does not currently play any significant role in strategic planning for our agency, yet everyone realizes how important workforce issues are to our ability to achieve our mission. Are there examples of agencies that perform good strategic HR planning?

This view searches the database based on specific workforce needs and functions (strategic workforce planning, organizational human resources, compensating and rewarding employees, managing employee performance, and human resources services). Selecting a topic displays a definition of the function. Selecting the resources option retrieves an alphabetical list of resource titles and a short description of each title. Clicking on the title brings the user to more detailed information, including the URL and contact information (if available).

The five human resources functions are further refined in View 3 in Figure 2.3. In the context of this project, human capital planning refers to all policies, programs, and procedures (e.g., recruitment, hiring, promotion, rewards, training, education, development, work life program

The screenshot displays the NCHRP Workforce Toolkit interface. At the top, the title "NCHRP Workforce Toolkit" is prominently displayed on the left, and a "Contact Us" button is on the right. Below the title bar, a breadcrumb trail reads "Home > Functional View". The main content area is titled "Functional View of Workforce Needs" and lists six primary categories, each with a "resources" link. A left-hand navigation menu includes options like "Top Ten DOT Needs", "FAQ", "Functional View" (which is highlighted with a mouse cursor), "Faceted Search", "Geographic View", "Text Search", "State Practices", "Home", "Forum", and "Video".

Functional View of Workforce Needs

1. [Strategic Workforce Planning Definition](#) *resources*
 1. [Human Capital Planning](#) *resources*
 2. [Workforce Planning](#) *resources*
 1. [Succession Planning](#) *resources*
2. [Operational Human Resources](#) *resources*
 1. [Organizing Work](#) *resources*
 1. [Tasks and Priorities](#) *resources*
 2. [Career Ladders and Paths](#) *resources*
 3. [Position Prioritization](#) *resources*
 2. [Recruiting and Retaining Talent](#) *resources*
 1. [Needs Identification](#) *resources*
 2. [Competencies and Education](#) *resources*
 3. [Recruitment Planning and Process](#) *resources*
3. [Compensating and Rewarding Employees](#) *resources*
 1. [Compensation Philosophies](#) *resources*
 2. [Compensation Systems](#) *resources*
 3. [Reward Programs](#) *resources*
 4. [Benefits Administration](#) *resources*
 5. [Benefits Planning](#) *resources*
 6. [Workmen's Compensation](#) *resources*
4. [Managing Employee Performance](#) *resources*
 1. [Performance Appraisal](#) *resources*
 2. [Performance Metrics](#) *resources*
 3. [Career Development](#) *resources*
 4. [Mentoring](#) *resources*
 5. [Coaching](#) *resources*
 6. [Employee and Labor Relations](#) *resources*

Figure 2.3. View 3—Functional view of workforce needs.

and benefits) which are used to attract, retain, and manage the workforce of an organization. The process involves carrying out a skills analysis of the existing workforce, carrying out manpower forecasting, and taking action to ensure that supply meets demand. This may include the development of training and retraining strategies.

Refining the subject also refines the search, retrieving more specifically targeted resources.

1. Strategic Workforce Planning
 1. Human Capital Planning
 2. Workforce Planning
 1. Succession Planning
2. Operational Human Resources
 1. Organizing Work
 1. Tasks and Priorities
 2. Career Ladders and Paths
 3. Position Prioritization
 2. Recruiting and Retaining Talent
 1. Needs Identification
 2. Competencies and Education
 3. Recruitment Planning and Process
3. Compensating and Rewarding Employees
 1. Compensation Philosophies
 2. Compensation Systems
 3. Reward Programs
 4. Benefits Administration
 5. Benefits Planning
 6. Workmen's Compensation
4. Managing Employee Performance
 1. Performance Appraisal
 2. Performance Metrics
 3. Career Development
 4. Mentoring
 5. Coaching
 6. Employee and Labor Relations
 7. Discipline
5. Human Resources Services
 1. Processing Personnel Actions
 2. Processing Pay Actions
 3. Other Backroom Operations

View 4 in Figure 2.4 allows the user to narrow the search parameters using the facets described in section 2.3 to produce matching resources. Five facets are available from the menu: need type, audience, source, DOT role, and resource type. Each option contains a drop-down menu that allows the user to further refine searches. Resources matching the selected facets are retrieved from the database, and the title and short description are displayed. Selecting a title retrieves detailed information described in Views 1–3.

The Geographic View in Figure 2.5 provides a visual representation of the United States and allows users to find information by state. This view is linked to tables that will contain information from state DOTs regarding knowledge systems and human resources information systems, contact information, links to state DOT web sites, statistics on number of state DOT employees, and information on which states outsource human resources functions and which have labor unions. Much of this data is not yet available. The AASHTO Subcommittee on

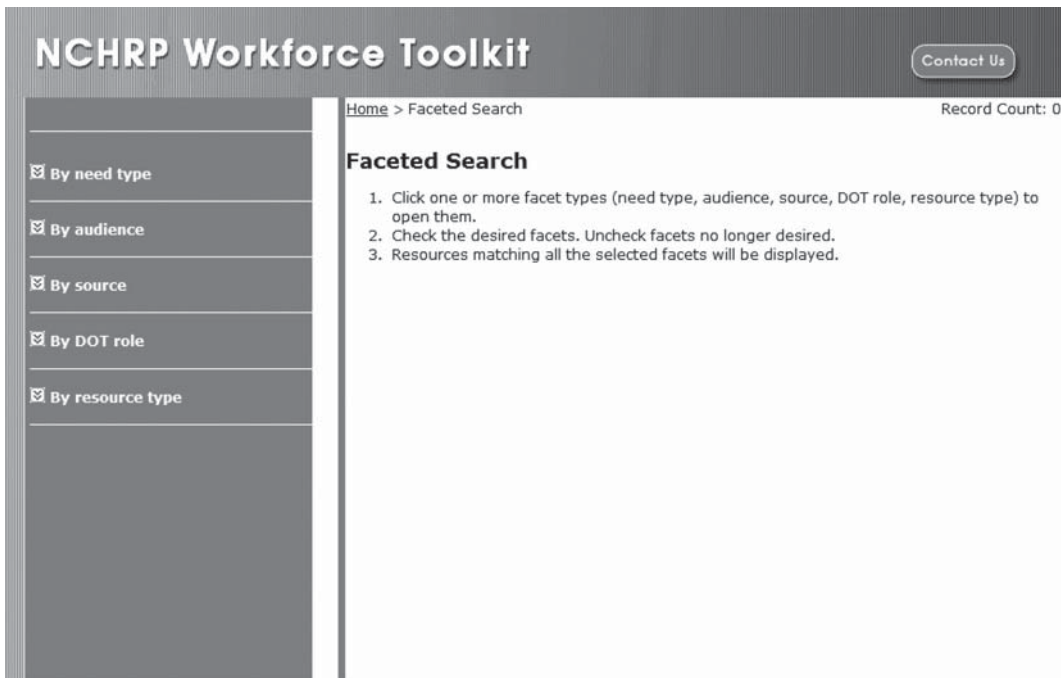


Figure 2.4. View 4—Faceted search.

Human Resources will populate this data base when possible. Source documents are not available from this view.

The Text Search shown in Figure 2.6 allows state DOT personnel to search by keyword(s) of their own choosing. Using words entered in the textbox, the Workforce Toolkit searches titles and descriptions to locate relevant sources. As with the views described above, selecting a title retrieves detailed information.

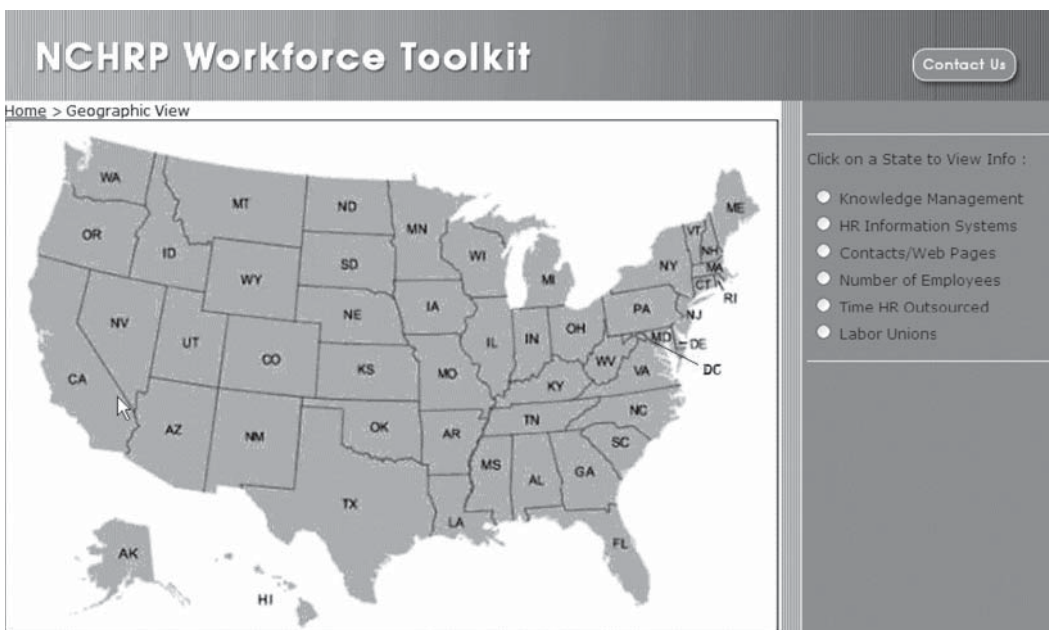


Figure 2.5. View 5—Geographic view.

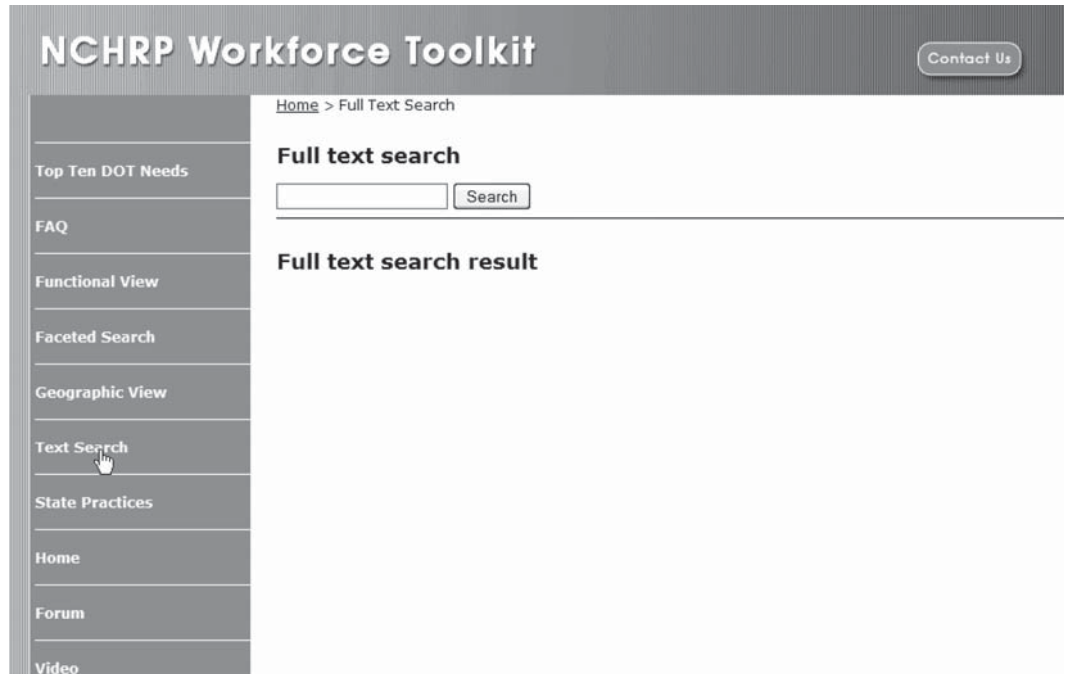


Figure 2.6. View 6—Text search.

The State Practices view in Figure 2.7 is linked to a third database that provides access to 62 web pages that display state-level data derived from the State Practices Excel spreadsheet developed in Phase 1 of this project. This view summarizes, by state, findings from NCHRP studies on recruitment, retention, succession planning, training, and change management. Additional surveys can be added in the future.

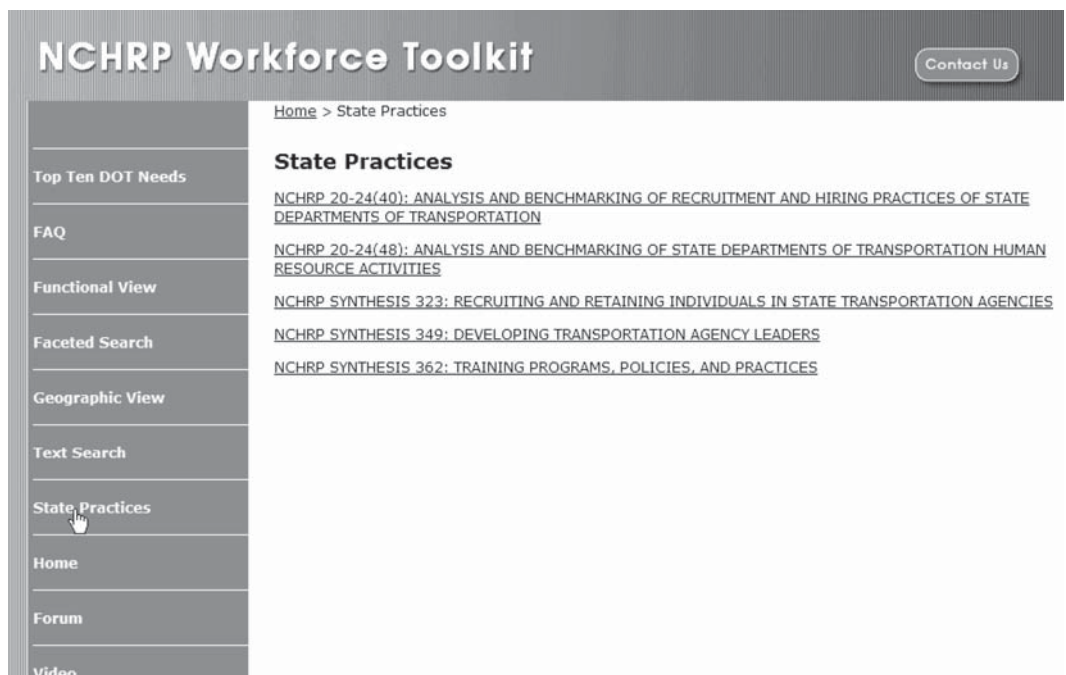


Figure 2.7. View 7—State practices.

Currently, this view contains information from surveys conducted for the following NCHRP projects and synthesis:

- NCHRP Project 20-24(40), “Analysis and Benchmarking of Recruitment and Hiring Practices of State Departments of Transportation;”
- NCHRP Project 20-24(48), “Analysis and Benchmarking of State Departments of Transportation Human Resource Activities;”
- *NCHRP Synthesis 323: Recruiting and Retaining Individuals In State Transportation Agencies;*
- *NCHRP Synthesis 349: Developing Transportation Agency Leaders;* and
- *NCHRP Synthesis 362: Training Programs, Policies, and Practices.*

Clicking on the individual studies retrieves a menu of subject options. These options, in turn, connect the user to the tables which cover the following subjects:

- Agency leadership;
- Crisis management;
- Critical skills identification;
- Communication resources;
- Education level of professionals;
- Employee demographics and work profile, including age, classification and gender of professionals; number of employees by division; years in state employment; years in current position; years to retirement; average number of hours worked per week, and the percentage of employees taking work home;
- Employee perceptions regarding pay raises, promotions, morale, and personal pride;
- Funding sources and methods;
- Human Resources, including competencies, outsourcing, and software usage;
- Knowledge management;
- Partnerships with other agencies, private sector organizations, non-profit entities, public sector agencies, and universities;
- Professional certification, registration, continuing education and certification programs;
- Recruiting, including attracting engineers, technicians, IT, and other professionals;
- Retention, including employee turnover rates, factors influencing the decision to leave state service, and the likelihood of leaving for the private sector;
- Retirement;
- Strategic Planning;
- Succession Planning; and
- Training and Development.

Selecting the “Home” option returns users to the home page of the Workforce Toolkit web site shown in Figure 2.8.

The Forum option in Figure 2.9 connects users to the FHWA’s Knowledge Sharing web Site. From this site, users can access Communities of Practice, which are virtual home bases providing members with access to information, discussion, and collaboration on specific subject areas of interest to the highway community. This link is included to illustrate the concept of user forums. The Toolkit steward can choose to use another social networking mechanism for user exchange for developing a forum focused solely on state DOT workforce issues.

Users can also access FHWA online presentations called “Knowledge On-Demand.” These multimedia presentations are self-contained packages that combine textual, audio, and video elements to create the learning experience of attending a presentation.

Selecting the “Video” option connects users to a YouTube site containing videos from the American Association of State Highway and Transportation Officials (AASHTO). AASHTO is

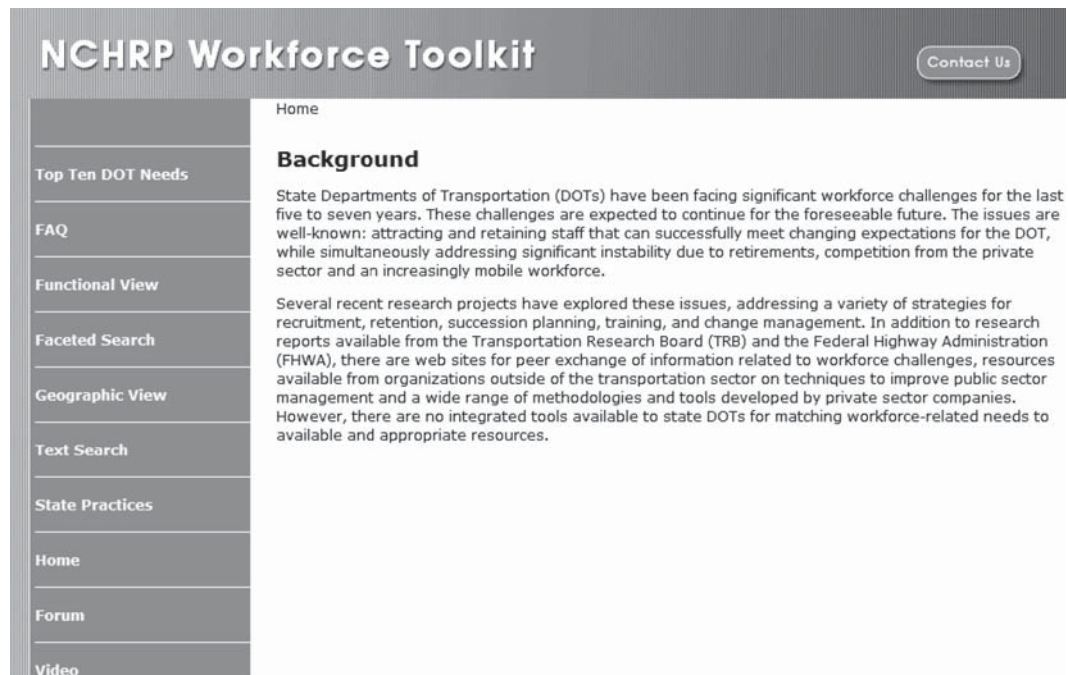
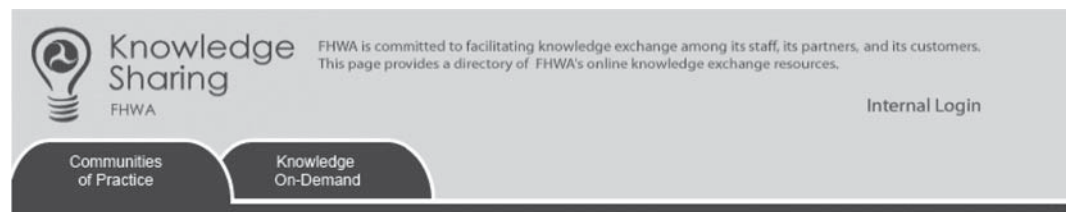


Figure 2.8. View 8—Home.



FHWA Communities of Practice

Below is a listing of FHWA's online Communities of Practice. These communities are virtual home bases providing members with access to information, discussion, and collaboration. Each community is dedicated to a specific subject area of interest to the highway community.

- [AASHTO Transp. Asset Management Today](#)
- [Disadvantaged Business Enterprise Exchange](#)
- [Evolving Practices Reference Library](#)
- [High Performance Concrete](#)
- [Highways For LIFE](#)
- ["It All Adds Up to Cleaner Air" Exchange](#)
- [LearningForum@FHWA](#)
- [Manual on Uniform Traffic Control Devices](#)
- [NTIMC Traffic Incident Management](#)
- [Performance Measurement Exchange](#)
- [Re-NEPA](#)
- [Rev. Estate Exchange](#)
- [Rumble Strips](#)
- [Highway Community Exchange](#)
 - Alternative Contracting
 - Detectable Warnings
 - Highway Finance Data Collection
 - Highway Performance Monitoring System (HPMS)
 - Knowledge Management Practice CoP
 - LTPP Standard Data Release
 - Marketing and Communications
 - Midwestern Transportation Research Network
 - Motor Fuel Reporting and HTF Attribution
 - National Highway Visibility
 - National Household Travel Survey
 - NCHRP 1-37A (Mechanistic-Empirical) Pavement Design Guide
 - Performance Measurement
 - Road Weather Management and Operations

Figure 2.9. View 9—Sample forum view.

currently developing a video portal that will allow viewing of videos without having to go through YouTube. This will allow video content to be accessible to all state DOT staff without filters blocking access to sites such as YouTube.

2.3 Design Components

The Toolkit has been designed to be useful in at least three situations: (1) a user wishing to understand an overall approach to identifying and addressing workforce issues, (2) a user searching for a range of solutions for addressing a specific problem, and (3) a user charged with implementing a particular program or initiative who is looking for useful models or software resources.

The Toolkit is dynamic, allowing new resources to be added over time through the Administration site. It also provides a mechanism for informal sharing of ideas within the community of DOT human resources practitioners. While it was not within the scope of this project to develop a fully automated search tool or portal, the research team designed the toolkit to address these needs. As the Toolkit evolves, the portal will accommodate additional resources.

To support a variety of needs and use scenarios and to maintain flexibility and extensibility, the research team identified a series of facets, or features, for identifying and categorizing the assembled resources. Each of these facets—need, role, source, type of resource, and audience type—are further refined with additional facets: 22 for workforce need type, 5 for role played within the DOT, 11 for information source type, 9 for the type of resource, and 8 for audience type. Combinations of these facets have been linked to the available resources to form the basis for searches. This reinforces a holistic approach to addressing workforce issues, while providing an easily understood topical organization of the resources.

2.3.1 Workforce Need Type

A list of workforce needs was developed to include the most pressing current and future issues and trends facing state DOTs. Categories can be added and/or eliminated as priorities change. Workforce needs are listed below.

Compensation and Benefits. This includes information, policies and practices relating to wage programs, insurance, retirement benefits, and other workplace compensation.

Competencies. This includes the knowledge, skills, experiences and behaviors required to perform successfully in jobs within the workplace.

Downsizing/Reductions in Force. This covers issues and trends relating to reductions in force resulting from terminations, layoffs, or retirements. These include the following:

- Forecasting,
- Advance planning,
- Mitigating fallout, and
- Costs and benefits of alternative approaches.

Employee Conflict. This covers issues of employee performance and issues of conflict within the workforce between employee and supervisor and employees with each other.

Human Resource Function. This refers to any of the basic functional areas of human resources including recruitment, hiring, placement, promotion, performance management, rewards, discipline, labor relations and work life quality.

Human Resource Information Systems (HRIS). This is a stand alone or integrated system designed to provide **information** used in HR decision-making, programs and functions. These include:

- Enterprise-wide systems for capturing workforce demographics and for processing personnel and payroll actions and activities,
- Learning management systems, and
- A wide variety of stand alone systems that support individual human resources programs and functions.

Human Resources Planning. This refers to information and methodologies used to ensure future staff is appropriate for future needs.

Knowledge Management. This is the set of policies, programs, procedures and other resources used to capture, organize, transfer, and store knowledge and experiences of individual workers and groups within an organization and making this information available to others in the organization when it is needed. Most organizations consider an information technology tool essential to a successful knowledge management program.

Leadership Development. This is an organization's policies, programs, and procedures for assuring that the organization has and will continue to have an adequate supply of well-developed talent from which to select its current and future leaders. Workforce development includes some of the following examples:

- Rotating assignments to assure future leaders have a variety of work experience within the organization,
- Mentoring and coaching,
- Special development assignments,
- Formal training in leadership tasks and competencies.

Organizational Change. This refers to an organization's policies, process, and methods for developing its internal capacities to help assure its current and future success in accomplishing its strategic goals and objectives. This category includes activities which support an organization's problem solving and renewal capabilities and capacities including assuring the following:

- Work is organized efficiently and effectively into jobs and career paths, with associated authority, responsibility, and accountability.
- The organization's values and culture are clearly aligned with its mission.
- Mechanisms (e.g., periodic reviews of program and/or resource allocations) exist to assess whether subordinate units within the organization are meeting agreed upon programmatic and employee performance requirements.
- Periodic examination and evaluation of programs, policies and procedures occur to reinforce the organization's effectiveness and efficiency.

Organizational Development. This includes planned and managed organization-wide effort to improve efficiency and effectiveness.

Organizational Performance. This includes the policies, programs, and procedures for comparing results achieved to organizational objectives or goals.

Outsourcing and Contract Management. This includes formal agreements with third parties to perform services for an organization. Initially, many organizations thought of outsourcing as contracting with a private sector organization to perform certain tasks. The definition is evolving to include any defined relationship with a third party to provide goods and services to the organization.

Performance Management. This includes the laws, policies, programs, processes, and other resources used to define a mission and desired outcomes, to set performance standards, to link budget to performance, to report results, and to hold public officials accountable for those results. Performance management concepts and practices are applied to both organizations and employees in organizations.

Recruitment. This includes the laws, policies, programs, and procedures used to attract well-qualified candidates to fill vacancies within an organization. Recruitment includes the following activities:

- Defining the policies and procedures that apply to recruitment activities.
- Defining the competencies and capabilities candidates must possess to function successfully in the organization.
- Developing an annual recruitment plan which identifies and links needs, sources to fill those needs, and the financial resources for recruitment activities.
- Defining roles and individuals in the organization who are responsible for recruitment, e.g., human resources department, line managers.
- Developing and applying methods to assess candidate credentials.
- Evaluating the results of recruitment efforts and using those results to refine the recruitment program and processes.
- Identifying sources for candidates and targeting marketing of positions to the candidate pool interests.

Retention. This includes the laws, policies, programs, and procedures used to retain the talent that is recruited into the organization. Retention includes the following activities:

- Defining the policies and procedures that apply to retention activities.
- Identifying the strategies and tactics to retain needed talent, e.g., financial incentives, work assignment incentives, work-life incentives such as flexible work hours, developmental incentives such as training or special assignments, etc.
- Defining roles and individuals in the organization who are responsible for retention of talent, e.g., human resources department, line managers, agency executives.
- Developing methods to assess the degree to which the organization is able to retain the talent it needs and wants to retain, e.g., employee satisfaction surveys, turnover statistics, exit interviews.
- Evaluating the results of retention efforts and using those results to refine the retention program and processes.

Retirement. This includes the laws, policies, programs, and procedures associated with assuring employees have appropriate retirement benefits, as well as research pertaining to an aging workforce.

Strategic Planning. This includes an organization's policies, process, and methods for defining its future direction by identifying the organization's programmatic goals and the outcomes that must occur if those goals are to be achieved. This analytical process also includes the allocation of financial and human resources to achieve the goals and outcomes agreed upon. The product of the strategic planning process is a strategic plan. Strategic plans usually focus on 5-year increments. The programmatic and resource allocation results of the strategic plan are reflected in the annual business or operating plans of subordinate units and in employee performance requirements. Organizations that use strategic plans to assure alignment between strategic goals and outcomes and the specific areas of responsibility and accountability of organizations and individuals tend to be more successful than those which do not have a structured process and methods.

Succession Planning. This is an organization’s analytical methodology for assessing the workforce competencies and capabilities needed to meet future requirements. It includes the following activities:

- Identifying the current and future work of the organization.
- Identifying the competencies and capabilities required to accomplish that work.
- Analyzing the degree to which those competencies and capabilities are present within the workforce.
- Describing the gap between what is available vs. what is needed.
- Developing strategies, e.g., recruitment, reassignment, training, contracting out, and closing the identified gaps.
- Repeating this process periodically (usually every 2–5 years) to assure that the workforce required will be available when it is needed.

Succession planning is most often focused on the identification of leadership needs. However, organizations are learning that succession planning should be focused on any mission critical occupational category.

Training and Development. This includes the range of activities and programs that organizations provide to help assure that employees at every level of the organization have the competencies and capabilities required to carry out the work of the organization effectively and efficiently.

Workforce Planning and Development. This includes the set of policies, programs, and activities related to developing and maintaining a talented and capable workforce consistent with and in support of the mission and goals of the organization.

Other. This category is used for resources that do not fit under any of the above categories.

2.3.2 DOT Role

While there are some common trends impacting workforce concerns across the entire DOT (outsourcing, downsizing, decentralization, retirements, turnover, mismatch of skills to needs), specific information needs vary based on the user’s role within the DOT. Each role may have specific concerns based on the scope of their responsibilities.

The perspectives of top agency executives (CEOs), senior managers (division chiefs and district administrators), human resources managers, and line managers/workgroup supervisors were considered. For senior managers and line managers, the researchers considered differences in concerns across functional areas (planning, engineering/design, construction, maintenance, operations, IT, administration, and finance), and across central office vs. field offices.

2.3.3 Information Source Type

Users searching for information on a specific challenge will also consider the information’s source, since source may indicate credibility and applicability to the user’s workplace. Ten source categories most relevant to the workforce challenges faced by DOTs were identified: TRB/NCHRP/TCRP; Journal/Publisher; National Academy of Public Administration (NAPA); the United States Department of Transportation (USDOT); state DOT; Other State Agency; University Research Center; National Association—Transportation; National Association—Public Administration; and National Association—Human Resources.

2.3.4 Resource Type

The type of resource was also deemed significant since some users may seek background information while others are looking for specific methodologies or survey instruments. Resource types include the following:

General Resource. Resources that fall outside the item types below, or that span multiple item types, e.g., reports, articles.

Methodology/Guide/Model. Resources that provide “how-to” knowledge, or step-by-step guides to addressing a workforce need.

Measurement/Assessment Tool. Resources that measure or assess the state of an organization’s existing situation with respect to a given workforce topic.

Case. Resources that collect specific organizations’ experiences.

Policy/Procedure. Resources related to official organization workforce policies or procedures.

Organization. Organizations that provide access to a useful body of workforce resources.

Software Application. Information technology resources.

Other. Resources that fall outside of these item types.

Consulting Services. Specialized services that provide information or recommendations from outside a company.

2.3.5 Audience Type

While all of the resources selected are relevant to the state DOT audience, an additional facet was added to classify resources based on their *intended* audience. For example, there are a large number of general resources that are targeted to human resources professionals across the spectrum of agency types. A state DOT toolkit user may want to distinguish these general resources from those that are specific to the DOT community. The audience types were defined as state DOT; Transportation Professionals; Other Industry; General Private Sector; General Public Sector; Human Resources; and Training and Development.

Building on these facets to direct searches, the team designed views of the information that support particular modes of use. The views, which are shown in section 2.2, are examples; views can be changed or added in the future.



CHAPTER 3

Workforce Toolkit Use

3.1 User Site

In designing this tool, the researchers recognized that different agencies will have different workforce needs given varying situations, and that combinations of resources will need to be used in an integrated way to take advantage of synergistic efforts. For example, succession planning indicates that integrated human capital programs and resources tend to be more effective at achieving organization outcomes than those which are used and viewed as separate entities. A variety of approaches to searching the Toolkit were created to address these needs.

Although views 1-4 shown in figures 3.1–3.4 each have a different structure for finding resources, all utilize the same pool of resources and draw upon the same faceted classification for those resources as shown in Figure 3.1.

For Top Ten DOT Needs (view 1), Frequently Asked Questions (view 2), and Functional View (view 3), the facets have been preselected by the research team. The Top Ten DOT Needs view combines the 10 priority issues defined by the rows with the needs defined in the column headings. Selecting “resource list” from the desired column and row retrieves relevant information from the database based on preprogrammed facets. For example, 1A, “I am seeking resources to help me understand issues and trends in strategic workforce planning,” searches for resources with the facets General Resource and Workforce Planning/Development.

The Frequently Asked Questions view is preprogrammed to retrieve information from the database that includes relevant workforce or need type and item or resource type. The program allows for multiple “or” commands within need type and multiple “or” commands within resource type to refine the search. For example, resources for question 1, “A large percentage of our organization’s workforce is due to retire over the next five years. How can we address this situation?” are culled from resources that address recruitment, succession planning, leadership development, retirement, or knowledge management. The database allows for one preprogrammed “and” clause in this view, similar to that implemented in View 1.

As with views 1 and 2, the Functional View search contains preprogrammed facets. However, this view allows users to drill down on a particular topic to find more focused resources. Retrieved information for function 1 (Strategic Workforce Planning), for example, is culled from resources containing information on workforce planning/development, succession planning, and knowledge management. The more specific issues under the general functions narrow the search by need type to eliminate irrelevant topics. Workforce planning (issue 1.2) searches only resources tagged as containing workforce planning/development material or succession planning information. Some functions are further refined (e.g., function 1.2.1, succession planning), which correlates

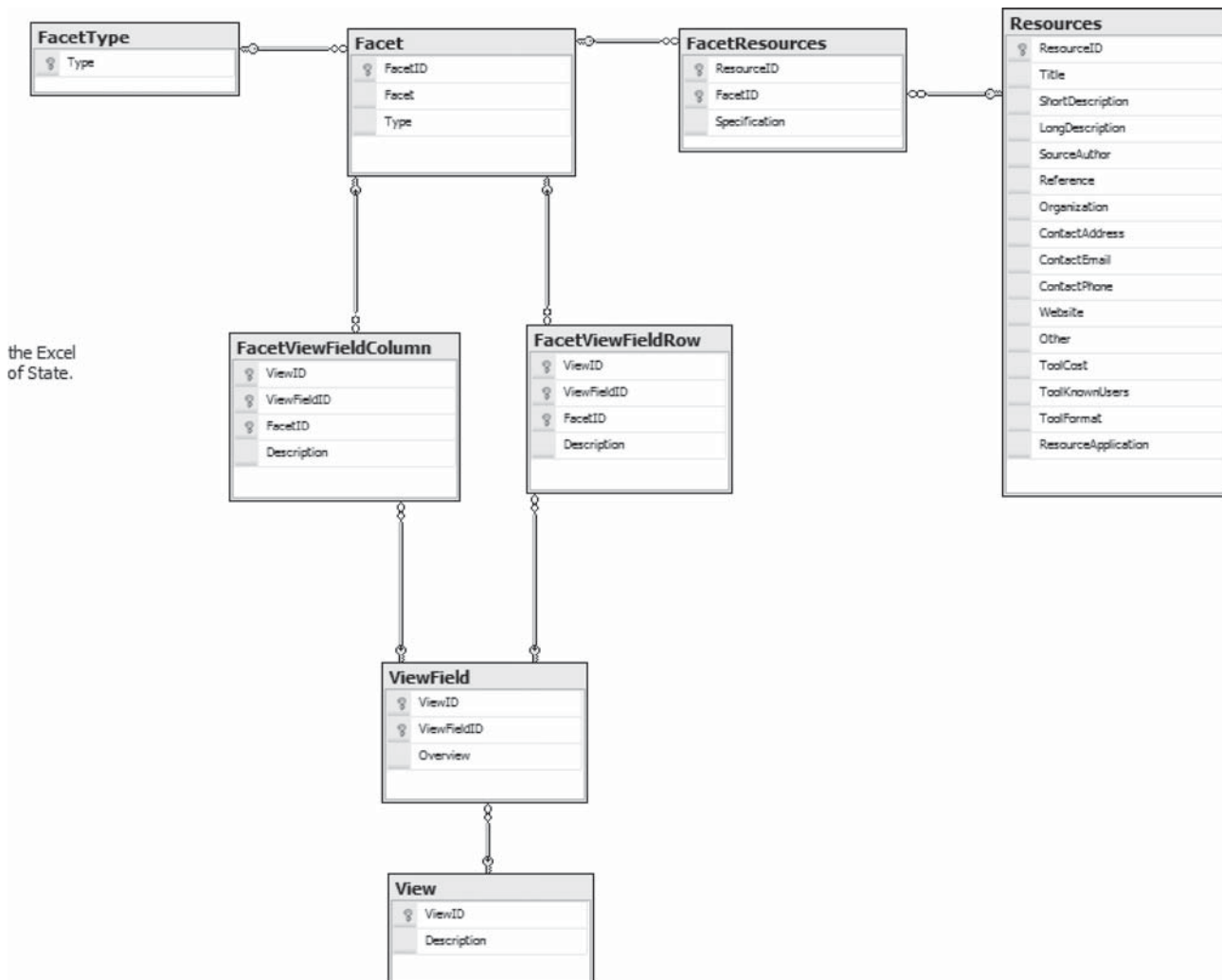


Figure 3.1. Data structure for faceted classification.

to a further refining of the search. In this example, resources retrieved are only those tagged with succession planning.

The database allows for a single preprogrammed “and” clause in this view, similar to that implemented in View 1.

Faceted Search (View 4) allows state DOT personnel to select the desired combination of any of the 54 facets. There is no restriction on the number of facets that can be selected in this view. Any combination of boxes (e.g., any combination of the 54 facets) within these can be checked, which allows for highly customized searches.

Text Search (View 6) likewise affords the user the opportunity to search based on individual needs; in this instance, the search is based on keywords.

Two additional screens Geographic View (View 5), and State Practices (View 7) access separate databases that do not contain resource listings. Presently, there is no data in the Geographic View table. View 7 accesses the state practices table as shown in Figure 3.2.

Home, Forum, and Video (Views 8, 9, and 10) are not linked to a database and contain no search functions. User Guide (View 11) connects the user to a PDF of the user guide for the Workforce Toolkit site.

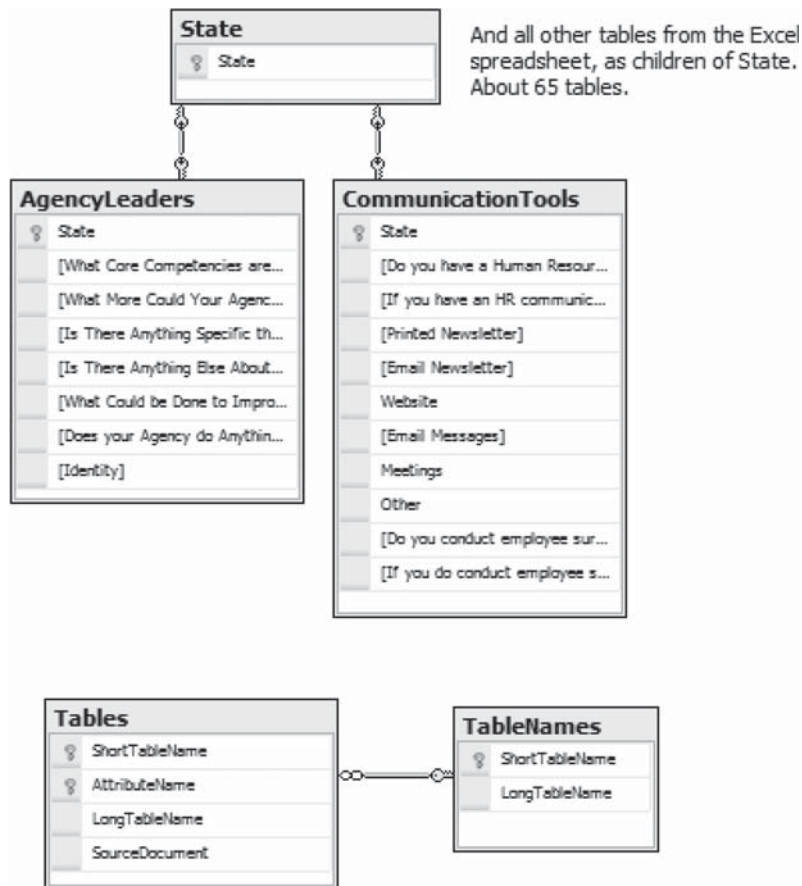


Figure 3.2. Data structure for state practices.

3.2 Administration Site

The Workforce Toolkit Administration site is an easy-to-use tool for site data management, including data entry, editing, and deletion. This site requires login with a username and password to make any changes to resources. Changes to the database can only be made through this site. The login automatically expires after 30 min of inactivity.

After logging in, the user can navigate to the Edit Resources or Edit Resource Facet pages. The site also contains a logout page and a home page.

3.2.1 Edit Resources

The Edit Resources page allows the site administrator to add, delete, or edit resources in the database. Resources can be quickly accessed by sorting them according to title or Resource ID. Once the desired resource is selected, a text box displays Resource ID, Resource title, and the option to edit or delete.

The edit option opens a screen displaying the resource's ID, title, short description, long description, author, and other relevant information including reference, organization, contact information, web site, resource cost and format, resource application, and other resource users (if known). Once the desired change has been made, the user selects "update" to accept the changes or "cancel" to discard them.

The delete option removes the resource from the database. The database allows a resource to be deleted even if it has facets.

Selecting “add a resource,” located above the table, opens a screen with fields for the resource ID, resource title, short description, long description, author, reference, organization, contact information, web site, resource cost and format, resource application, and other resource users (if known). Resource ID numbers must be manually entered; the system will not allow resources with duplicate ID numbers. To determine the next sequential resource ID number, the administrative user must navigate to the last page of the existing resources list. Once the new resource information is entered, the administrative user can add the resource to the database by clicking on “accept” or discard the entry by selecting “cancel.”

3.2.2 Edit Resource Facets

The Edit Resource Facet page allows the administrative user to add or delete facet types or values associated with a document. Chapter 2.3 of this report explains facets in more detail.

Resources can be sorted by title or Resource ID. Selecting the desired resource displays the existing facets for the resource. “Insert” adds the facet; “cancel” discards the new facet and returns the user to the prior screen.

Facets can be deleted by selecting “delete” next to the facet to be eliminated for that resource.

3.3 Workforce Toolkit Scenarios

The scenarios in this chapter present examples of how the Workforce Toolkit might be used to respond to a typical workforce issue.

3.3.1 Scenario 1—Planning for Loss of Experienced Staff

Problem. The Legislature has passed a retirement incentive bill that gives a 6-month window for eligible employees to retire. The state personnel office estimates that about 5% of the highest paid employees will be eligible. Based on their employees’ tenure, the DOT knows that up to 19% of their experienced employees could retire. To complicate matters, a major layoff several years earlier due to budget cuts has left the DOT with few employees experienced enough to take the retirees’ place if they leave. The DOT’s human resources director has been tasked with ensuring the workforce remains sufficient to meet the agency’s mission despite these factors.

Solution. Assuming that other DOTs must face a similar challenge, the HR director selects Top Ten DOT Needs from the Home view of the Workforce Toolkit (Figure 3.3). After reviewing overviews of the options, she decides to retrieve resources from columns A–D (understand issues and trends; learn about peer agencies; asses our situation; and implement programs, policies, and procedures) relating to the following issues:

- Strategic workforce planning,
- Attracting and retaining talent,
- Preparing the next generation of leaders, and
- Preserving institutional knowledge.

Next, the HR director checks the Frequently Asked Question page for additional resources and discovers the question, “A large percentage of our workforce is due to retire over the next 5 years. How do we address this situation?” Selecting that question retrieves titles and short descriptions of useful resources as shown in Figure 3.4.

Meanwhile, the human resources director has asked her assistant to find resources using another view in the Workforce Toolkit. The assistant decides to use Faceted Search view. From the main Faceted Search page, the assistant clicks on the drop-down menu for need types and checks recruitment, retention, retirement, knowledge management, training, succession planning, and compensation and benefits as shown in Figure 3.5.

My organization needs to address	A. Understand issues and trends	B. Learn about peer agencies	C. Assess our situation	D. Implement programs, policies, procedures
1. Strategic workforce planning	Overview Resource list	Overview Resource list	Overview Resource list	Overview Resource list
2. Attracting and retaining talent	Overview Resource list	Overview Resource list	Overview Resource list	Overview Resource list
3. Retooling the workforce to meet evolving business needs	Overview Resource list	Overview Resource list	Overview Resource list	Overview Resource list
4. Grooming the next	Overview	Overview	Overview	Overview

Figure 3.3. Finding resources from Top Ten DOT Needs View.

Title	Short Description
A Workforce Development Program for SCDOT	This project involved the development of a workforce and succession management plan for the South Carolina Department of Transportation, focusing on the maintenance area of the department.
Advanced Succession Planning: Next Generation Practices for Ensuring Your Organization's Future	This article offers methods and tools to integrate succession planning into workforce planning.
Analysis and Benchmarking of State DOT Human Resource	This benchmarking study identifies gaps and best practices of state Department of Transportation human resources (HR) activities. It includes

Figure 3.4. Finding resources by FAQ.

Facet	Count
Strategic Planning	12
Other	22
Organizational Development	13
HR Information Systems	12
Retention	40
Compensation and Benefits	21
Downsizing/Reduction in Force	13
Retirement	8
Workforce Planning/Development	50
Organizational Change	19
Leadership Development	21
HR Planning	12
Organizational Performance	17
HR Function	20
Employee Conflict	4
Competencies	22
Recruitment	61
Succession Planning	12

Title	Short Description
2007 AASHTO Salary Survey	This annual survey is administered by the American Association of State Highway and Transportation Officials (AASHTO) to collect wage and salary information from all state highway agencies. Input allows AASHTO to track salary changes and react quickly to downturns or benefit from new opportunities.
A Workforce Development Program for SCDOT	This project involved the development of a workforce and succession management plan for the South Carolina Department of Transportation, focusing on the maintenance area of the department.
Advanced Succession Planning: Next Generation Practices for Ensuring Your Organization's Future	This article offers methods and tools to integrate succession planning into workforce planning.
American Society for Training and Development (ASTD)	The American Society for Training and Development is the most prominent of the professional organizations for continuous learning information. It is also a source of information about online or e-learning.
Analysis and Benchmarking of State DOT Human Resource Activities	This benchmarking study identifies gaps and best practices of state Department of Transportation human resources (HR) activities. It includes an online survey and in depth interviews on this topic. The study also reports on states' experiences with outsourcing HR functions and the relationship of HR system functionality to meeting strategic human resources and workforce goals.
Analysis and Benchmarking of	This study presents the analysis and synthesis of successful

Figure 3.5. Finding resources by need type.

By audience			
Facet	Count		
State DOT	61 <input checked="" type="checkbox"/>		
Transportation Professionals	18 <input checked="" type="checkbox"/>		
Other Industry	7 <input type="checkbox"/>		
General Public Sector	68 <input type="checkbox"/>		
General Private Sector	43 <input type="checkbox"/>		
Other	20 <input type="checkbox"/>		
Human Resources	135 <input checked="" type="checkbox"/>		
Training and Development	31 <input type="checkbox"/>		

By source			
Facet	Count		
TRB/NCHRP/TCRP	29 <input checked="" type="checkbox"/>		
Journal/Publisher	36 <input checked="" type="checkbox"/>		
Other	72 <input type="checkbox"/>		
NAPA	9 <input checked="" type="checkbox"/>		
USDOT	6 <input type="checkbox"/>		
State DOT	23 <input checked="" type="checkbox"/>		
Other State Agency	17 <input type="checkbox"/>		
University Research Center	8 <input checked="" type="checkbox"/>		
National Association - Transportation	6 <input checked="" type="checkbox"/>		
National Association - Public Administration	12 <input type="checkbox"/>		
National Association - Human Resources	15 <input checked="" type="checkbox"/>		

Development Program	
Capital Project employees: It used a four-phase process to develop the plan: (1) Need Identification, (2) Need Quantification, (3) Plan to Meet Needs, and (4) Implementation Plan.	
Beyond Generation X: A Practical Guide for Managers	Beyond Generation X: A Practical Guide for Managers is a guide to understanding, successfully managing, and motivating Generation X'ers.
Building a Synergistic and Cohesive Management and Operating Team, Light Rail: Investment for the Future	This report recommends a synergistic team building approach for use in Light Rail start-ups that could be applied to design-build and operations staff involved in transportation project development and operations.
Building a World-Class Workforce: Two case studies	Diversity is a critical element of a world-class workforce, but its recruitment and retention is a challenge. This report offers two case studies of how companies are innovating recruitment and retention strategies to ensure a skilled, motivated, and diverse workforce.
Building Competitive Advantage Through People	Today's scarce, sought-after strategic resource is expertise, which comes in the form of employees.

Figure 3.6. Finding resources by audience type.

By source			
Facet	Count		
TRB/NCHRP/TCRP	29 <input checked="" type="checkbox"/>		
Journal/Publisher	36 <input checked="" type="checkbox"/>		
Other	72 <input type="checkbox"/>		
NAPA	9 <input checked="" type="checkbox"/>		
USDOT	6 <input type="checkbox"/>		
State DOT	23 <input checked="" type="checkbox"/>		
Other State Agency	17 <input type="checkbox"/>		
University Research Center	8 <input checked="" type="checkbox"/>		
National Association - Transportation	6 <input checked="" type="checkbox"/>		
National Association - Public Administration	12 <input type="checkbox"/>		
National Association - Human Resources	15 <input checked="" type="checkbox"/>		

Developing Tomorrow's Transportation Workforce	
This article discusses what challenges policy-makers and program managers face in ensuring that the current and future transportation workforce has the skills and knowledge it needs to be effective, and how to handle these challenges.	

Figure 3.7. Finding resources by source type.

Next, the assistant selects three audience types: State DOT, Transportation professionals, and human resources as shown in Figure 3.6.

For sources of information, the assistant checks TRB/NCHRP/TCRP, journal/publisher, NAPA, state DOT, university research center, national association—transportation, and national association—human resources as shown in Figure 3.7.

Next, he must decide which DOT roles will be affected by the Legislature’s retirement incentive bill and by the impending retirement of experienced employees. Since a workforce reduction of this magnitude would be felt throughout the agency, he selects all the options in the DOT role category: Top agency executives (CEOs), senior managers (division chiefs and district administrators), human resources, line managers/workgroup supervisors, and other as shown in Figure 3.8.

Finally, he decides on the type of resources needed to address the situation, and elects to search general resources, methodology/guide/model, case studies, and policy/procedure as shown in Figure 3.9.

The human resources director and assistant review the list of resources they have gathered, select the most relevant resources, and use the Workforce Toolkit to find the resources they need. To do this, they click on the work’s title, which opens a screen containing title, author, short description, long description, and additional information—such as an email, phone number, or web site—for finding the document as shown in Figure 3.10.

By DOT role			
Facet	Count		
Top agency executives (CEOs)	47 <input checked="" type="checkbox"/>		
Senior managers (division chiefs and district admi	50 <input checked="" type="checkbox"/>		
Human Resource	122 <input checked="" type="checkbox"/>		
Line managers/workgroup supervisors	36 <input checked="" type="checkbox"/>		
Other	7 <input checked="" type="checkbox"/>		

Figure 3.8. Finding resources by DOT role.

By resource type			
Facet	Count		
General Resource	99 <input checked="" type="checkbox"/>		
Methodology/Guide/Mode	107 <input checked="" type="checkbox"/>		
Measurement/Assessment Tool	41 <input type="checkbox"/>		
Case	86 <input checked="" type="checkbox"/>		
Policy/Procedure	22 <input checked="" type="checkbox"/>		
Organization	28 <input type="checkbox"/>		
Software Application	12 <input type="checkbox"/>		
Other	8 <input type="checkbox"/>		
Consulting Services	2 <input type="checkbox"/>		

Figure 3.9. Finding resources by resource type.

NCHRP Workforce Toolkit	
Contact Us	
Home > Faceted Search > Faceted Search Resource Detail	
<ul style="list-style-type: none"> Top Ten DOT Needs FAQ Functional View Faceted Search Geographic View Text Search State Practices Home Forum Video 	<p>Title A Workforce Development Program for SCDOT</p> <p>ShortDescription This project involved the development of a workforce and succession management plan for the South Carolina Department of Transportation, focusing on the maintenance area of the department.</p> <p>LongDescription Given the implementation of early retirement incentive programs, technological improvements, and the need to strategically determine which positions are necessary, workforce development and/or succession planning has become crucial in the current workplace. The focus of this project was to include the development of a workforce plan for the South Carolina Department of Transportation (SCDOT), specifically focusing on the maintenance area of the department. In order to provide a comprehensive study and proposal, the process incorporated a literature review, a comparison of other Departments of Transportation (DOTs), a study of DOTs with similar programs, career ladders for the classification series of Trades Specialists I-V, prototype position descriptions, and cost structure determination. The focus and significance of this project was based on the ability of SCDOT to be successful by accurately projecting future workforce needs and taking steps to assure that this workforce is in place. The research was a conceptual design that incorporated the potential for a progressive system of advancements based on acquisition of skills, abilities, and demonstration of competencies. The result was a Workforce Development Program that integrated the needs of the department with an opportunity for advancement for employees.</p> <p>SourceAuthor Nadim Mahmoud Aziz FHWA-SC-05-03, http://newfirstsearch.odc.org/WebZ/FSFETCH?fetchtype=fullrecord;sessionid=fsapp9-48896-f5guumz7-6x66fu;entitypagenum=23:0;recno=3;resultset=6;format=FI;next=html</p> <p>Reference</p>

Figure 3.10. Summary view of individual resource.

After reviewing the available resources, the HR director can report to management about current practices, policies, and experiences relating to preserving knowledge, identifying and training for competencies, planning for and guiding succession, targeting recruitment strategies, and creating or modifying a workforce human capital plan.

3.3.2 Scenario 2—Attracting Skilled Engineers to Public Sector Jobs

Problem. Higher salaries paid by private sector firms make it difficult to recruit engineering technicians. State salary policies limit what the DOT can pay, and traditional sources for new engineering technicians can't educate enough people to supply private sector firms and the DOT. The state DOT director plans to launch initiatives designed to identify competencies, train and develop existing staff, find new ways to recruit engineering technicians, and plan for the future in terms of ensuring that the agency-specific knowledge and skills of current engineering technicians are passed on to new hires. In addition, the DOT director hopes to review data on outsourcing these duties in the event that it becomes necessary.

Solution. To educate himself about what other state DOTs and public agencies are doing to recruit and retain qualified engineers, the director first uses the FAQ View in the Workforce Toolkit. There he discovers this question arises frequently in state DOTs; clicking on the question reveals a list of resources. However, the director wants to narrow his search to more specifically address his needs, so he goes to the Full text search view of the Toolkit. Entering “engineers” as a search word retrieves titles and short descriptions that can help Figure 3.11.

To learn more about using an engineering consulting firm, he searches on “consultant” (Figure 3.12).

To refine his search, the director enters a combination of search words, “engineer training competency” (See Figure 3.13).

The screenshot shows the NCHRP Workforce Toolkit interface. On the left is a navigation menu with links: Top Ten DOT Needs, FAQ, Functional View, Faceted Search, Geographic View, Text Search, State Practices, Home, Forum, and Video. The main content area shows a search path: Home > Full Text Search. Below this is a search box containing the text 'engineers' and a 'Search' button. The results are titled 'Full text search result' and are presented in a table with two columns: 'Title' and 'Short Description'.

Title	Short Description
Filling the Pipeline: A milestone agreement for an urgent industry-wide partnership to attract and retain transportation workers	An agreement emerged from the National Workforce Summit in May 2002, where all present transportation leaders signed 'A Partnership for Educating, Training, and Developing the Nation's Transportation Workforce'. The meeting's agenda was designed for sharing ideas and insights into the state of the transportation industry's workforce.
Guide to Hiring and Retaining Great Civil Engineers	The American Society of Civil Engineers Committee on the Employment of Civil Engineers published this guide on finding and keeping the best civil engineers.
Home Depot Goes Old School The retailer's new talent gold mine? Retirees who know more, and sell more, than their younger counterparts	This article reports on how Home Depot is partnering with the 35-million-member AARP to hire an army of tech-savvy retirees.
Human Capital: Selected Agencies' Experiences and Lessons Learned in Designing Training and Development Programs	The U.S. General Accounting Office identified important lessons learned from five federal agencies' experiences in designing employee training and development programs that could be applied to other agencies facing similar challenges. The knowledge gained relates to the three areas of assessing agency skill requirements and identifying training needs, developing strategies and solutions for training needs, and determining

Figure 3.11. Finding resources using text search.

The screenshot shows the NCHRP Workforce Toolkit interface with the search term 'consultant'. The navigation menu is the same as in Figure 3.11. The search path is Home > Full Text Search. The search box contains 'consultant' and the 'Search' button is highlighted. The results are titled 'Full text search result' and are presented in a table with two columns: 'Title' and 'Short Description'.

Title	Short Description
Building a Scalable Human Capital Infrastructure	An increased need for knowledge workers and project professionals, combined with a shortage of in-house resources and/or tight development timeframes often leads to the need to supplement staff with experienced outside experts who can seamlessly integrate into an existing team to add value immediately. This article talks about the benefits of using project professionals and how to manage them.
Organizational Change: EMPOWER Kentucky	EMPOWER Kentucky is a change initiative aimed at redesigning the organization's operations and streamlining its procedures. Amongst other progress, the initiative has affected organizational roles and responsibilities, and improved employee communication tools.
Project Lead The Way	Project Lead The Way, Inc. (PLTW) is a national program forming partnerships among public schools, higher education institutions and the private sector to increase the quantity and quality of engineers and engineering technologists graduating from the country's education system. The PLTW website contains information on curriculum, implementation, school certification, college credit for teachers and students, and much more.
When to Call the Organization Doctor	This article discusses the steps an organization should take toward first diagnosing the real problems in their organizations, before prescribing solutions for them.

Figure 3.12. Modifying a text search.

The screenshot shows the NCHRP Workforce Toolkit website. The header includes the title 'NCHRP Workforce Toolkit' and a 'Contact Us' button. A breadcrumb trail reads 'Home > Full Text Search'. Below this is a search bar with the text 'engineer training comp' and a 'Search' button. The search results are displayed in a table with two columns: 'Title' and 'Short Description'.

Title	Short Description
Human Capital: Selected Agencies' Experiences and Lessons Learned in Designing Training and Development Programs	The U.S. General Accounting Office identified important lessons learned from five federal agencies' experiences in designing employee training and development programs that could be applied to other agencies facing similar challenges. The knowledge gained relates to the three areas of assessing agency skill requirements and identifying training needs, developing strategies and solutions for training needs, and determining methods for evaluating training programs.

Figure 3.13. Using multiple search words in text search.

3.3.3 Scenario 3—Attracting Skilled Engineers to Public Sector Jobs

Problem. The human resources director has noted a dearth of qualified applicants for entry-level and mid-level positions. Although the volume of applications is high, the recruiting strategies used in the past no longer seem to be attracting the right candidates. Additionally, budget cuts have raised questions about the effectiveness of career fairs, which have been labor-intensive and expensive. The director wants to reassess the agency’s mix of advertising, career fairs, and re-hiring practices to use resources more efficiently while drawing a better candidate pool.

Solution. Knowing that the experiences of peer organizations will be useful in helping formulate a new recruiting strategy, the human resources director selects the State Practices view of the Workforce Toolkit.

The director selects the first option to access NCHRP Project 20-24(40), “Analysis and Benchmarking of Recruitment and Hiring Practices of State Departments of Transportation” (Figure 3.14). This leads to two tables that can be viewed: Effectiveness of Recruiting and Most Successful Practices for Recruiting Employees (Figure 3.15).

Selecting the first option reveals a table that shows how states measure the effectiveness of various strategies they employ for recruiting for entry-level and mid-career level employees (Figure 3.16a).

The second option provides a state-by-state view of the three most successful strategies used for recruiting entry-level and mid-level employees (Figure 3.16b).

Using this information, the human resources director suggests incentive programs for employees suggesting individuals who are ultimately hired by the agency, increasing visibility and accessibility of job postings on the agency web site, and a percentage decrease in the number of job fairs held annually.

The screenshot shows the NCHRP Workforce Toolkit website. The header includes the title "NCHRP Workforce Toolkit" and a "Contact Us" button. The breadcrumb trail is "Home > State Practices". The main content area is titled "State Practices" and lists three resources:

- [NCHRP 20-24\(40\): ANALYSIS AND BENCHMARKING OF RECRUITMENT AND HIRING PRACTICES OF STATE DEPARTMENTS OF TRANSPORTATION](#)
- [NCHRP 20-24\(48\): ANALYSIS AND BENCHMARKING OF STATE DEPARTMENTS OF TRANSPORTATION HUMAN RESOURCE ACTIVITIES](#)
- [NCHRP SYNTHESIS 323: RECRUITING AND RETAINING INDIVIDUALS IN STATE TRANSPORTATION AGENCIES](#)

Below these are two more resources:

- [NCHRP SYNTHESIS 349: DEVELOPING TRANSPORTATION AGENCY LEADERS](#)
- [NCHRP SYNTHESIS 362: TRAINING PROGRAMS, POLICIES, AND PRACTICES](#)

The left sidebar contains navigation links: Top Ten DOT Needs, FAQ, Functional View, Faceted Search, Geographic View, Text Search, State Practices (highlighted with a mouse cursor), Home, Forum, and Video.

Figure 3.14. Finding resources using State Practices View.

The screenshot shows the NCHRP Workforce Toolkit website. The header includes the title "NCHRP Workforce Toolkit" and a "Contact Us" button. The breadcrumb trail is "Home > State Practices > State Practices Benchmarks - DOT". The main content area displays the title "NCHRP 20-24(40): ANALYSIS AND BENCHMARKING OF RECRUITMENT AND HIRING PRACTICES OF STATE DEPARTMENTS OF TRANSPORTATION" and lists two sub-topics:

- [Effectiveness Of Recruiting](#)
- [Most Successful Practices for Recruiting Employees](#)

The left sidebar contains navigation links: Top Ten DOT Needs, FAQ, Functional View, Faceted Search, Geographic View, Text Search, State Practices (highlighted with a mouse cursor), Home, Forum, and Video.

Figure 3.15. Searching State Practices by study.

NCHRP Workforce Toolkit Contact Us

Home > State Practices > State Practices Benchmarks - DOT > Effectiveness Of Recruiting Strategies

Effectiveness of Recruiting

NCHRP 20-24(40): Analysis and Benchmarking of Recruitment and Hiring Practices of State Departments of Transportation

State	Measuring the Effectiveness of Recruiting Entry Level Employees	Measuring the Effectiveness of Recruiting Mid-Career Level Employees	Relevant Issues Regarding the Demographics of the Agency
AR	Number of contacts and/or new hires.	Number of contacts and/or new hires or promotions.	
CA	Use an online survey, includes specific categories as to how they became aware of the position, for example Internet site, California DOT site, friends, advertisement, etc	Use an online survey, includes specific categories as to how they became aware of the position, for example, Internet site, Caltrans site, friend, advertisement, etc	
CT	Our outside hire to other classifications is limited but we have had success with advertising and professional periodicals and on the Internet. Connecticut also continues to have reemployment obligations from recent layoffs and reorganization restructure	Appointment time and retention.	
DC		The percentage of the remaining vacancies.	

(a)

NCHRP Workforce Toolkit Contact Us

Home > State Practices > State Practices Benchmarks - DOT > Successful Recruiting Strategies

Successful Recruiting Strategies

NCHRP 20-24(40): Analysis and Benchmarking of Recruitment and Hiring Practices of State Departments of Transportation

State	Employee Level	#1	#2	#3
AR	EntryLevel	Advertising jobs on dept website (central and field offices)	Career fairs (central and field offices)	Engineering student intern program for recruiting civil engineers (central and field offices)
AR	MidLevel	Advertising jobs on dept website (central and field offices)	Career fairs (central and field offices)	Promotion from within
CA	EntryLevel	Recruitment on a statewide and a nationwide basis at colleges and universities with a focus for graduating seniors in our hard to place classifications. (Transportation Civil Engineer, Transportation Surveyor, Transportation Planner, Environmental Planner	The California DOT Internet site which provides all of the necessary information regarding open positions and instructions on how to apply.	
CA	MidLevel	Caltrans website which provides all the necessary information regarding open positions and instructions on how to apply		
		We are in the process of revising our procedure: job posting	Examination, certification	Re-employment

(b)

Figure 3.16. State Practices data tables.

Recommended Future Initiatives

4.1 Overview

State DOTs are being forced to make significant adjustments as financial resources become more limited, transportation infrastructure ages, traffic volumes increase, and technology reliance increases. These changes are shifting the workforce landscape of state DOTs. While it is impossible to accurately predict all future workforce needs, it seems likely that literature, practices, and other resources will be updated and made available as progress is made in the industry. This protean nature of needs and resources dictates the need for a similarly flexible toolkit.

The web site developed in this project as a demonstration of the Workforce Toolkit necessarily will have a limited life. No financial support or other resources have been provided by NCHRP or other sponsors to support the maintenance of the Toolkit or web site following completion of the research project.

The future utility of the Workforce Toolkit depends on it remaining a current resource that meets the changing needs of a dynamic audience. Resources will need regular updating, and elements of the site (e.g., views, needs, and facets) may need to be refined as workforce challenges continue to evolve. Fundamental to the success of this initiative is ownership by an entity that hosts the site and engagement with the state DOT community that provides an ongoing sense of specific agency needs.

4.2 Dynamic Resources

An important asset of this tool is the ease with which it can be modified and updated. The views chosen for the prototype are based on research and input from the panel and the AASHTO Subcommittee on Human Resources; however, views can be added, deleted, or modified. Resources can be efficiently added or deleted by any authorized user through the password-protected administration site. As information becomes available for the Geographic View, it can be added to the existing tables by the Toolkit Web master for the site. An important feature of this view is that it provides a foundation for displaying information from state DOT Geographic Information Systems (GIS). As the Toolkit evolves, more sophisticated GIS querying and analysis capabilities can be added to its functions.

The Toolkit Web master can also add new information, including studies from state and federal entities other than NCHRP, to the State Practices View. Any authorized user can edit facets for existing or newly added resources; the technical administrator can change facet categories by, for example, adding National Professional Associations as a source type, or even by adding or deleting a facet category. This type of action should be done carefully since all of the reports are designed using the existing set of facet categories. If changes to the facet lists are made, the queries that determine the view outputs need to be adjusted.

4.3 Community Interest and Involvement

Active participation from a variety of state DOT user groups will ensure that the Workforce Toolkit remains a useful resource that supports peer exchanges and successful practices in responding to current and future workforce challenges. The community could become involved by submitting materials for inclusion in the database; recommending and/or reviewing resources; composing/contributing to a list of favorite resources; and suggesting new Frequently Asked Questions, facets, and views.

The Forum View provides a DOT workforce portal that can be expanded to include views in addition to the FHWA Communities of Practice site and can incorporate a number of features commonly found as part of current web sites. Additional views might include the following:

- Schedule of workforce-related conferences and training courses, consolidated across multiple sponsoring organizations;
- Discussion forums on specific topics of interest, allowing practitioners to pose questions to their peers;
- Lessons learned and best practice area, for one-page descriptions posted by DOT staff;
- URL link collections; and
- Performance benchmarking area for key metrics (e.g., turnover rates, time to fill open positions).

Additional features might include:

- Incorporation of user reviews of information resources;
- User tagging of information resources;
- Capability for users to submit resources for incorporation into the resource base;
- Capability for users to sign up for notifications when new resources of interest are posted; and
- Periodic web surveys and posting of results to provide snapshots of current practice and recent activities.

These capabilities are easily accomplished with existing software.

4.4 Hosting the Site

To keep the Toolkit fresh and maintain its utility for the user community, we recommend that the AASHTO Subcommittee on Human Resources assumes stewardship to maintain, update, and market the toolkit, and that it be housed on an AASHTO-sponsored web site.

4.5 Other Considerations

Some DOTs restrict YouTube use on company computers. A member of the research team met with the Web master/IT manager for AASHTO in May 2008. It was his suggestion that video be handled through AASHTO's video portal that is currently being developed. This issue will need to be addressed before the toolkit is launched on the AASHTO web site.



PART B

Development of the Workforce Toolkit

Needs Framework

5.1 Introduction

In response to NCHRP Project 20-72, “Tools to Aid State DOTs in Responding to Workforce Challenges,” the Spy Pond Partners team reviewed current tools, assessed available resources, and developed and built a toolkit designed to help state DOTs overcome current and future workforce challenges. Specific tasks associated with this two-phase project are explained in Chapter 3.1. This section provides more detail on the research and development that supports the Workforce Toolkit.

The following section (5.2) establishes and defines the major categories of needs. The remaining three sections of this chapter map these categories of needs first to specific workforce scenarios that might precipitate a search for resources in the Toolkit (Section 5.3), then to current trends (Section 5.4), and finally to likely future trends (Section 5.5).

5.2 Needs Categories

The research team developed a needs framework that defined the scope of resources for inclusion in the Toolkit and provided the fundamental set of categories to be used to match information resources to workforce needs faced by state DOTs. The framework was developed based on the guidance provided in the research statement and supplemented by analysis of current workforce issues and trends—both near term and future. Components of the needs framework are described in Section 2.3.

The categories were chosen because they reflect the most pressing and continuing current and future (5–10 years) workforce needs of state DOTs. These categories also reflect a manageable number of areas of focus and thus should help assure that state DOT users of the database will find these categories responsive to their needs. Additional categories can be identified and added to the data base as future needs emerge.

5.3 Current Workforce Needs Scenarios

Table 5.1 presents a set of scenarios that illustrate some of the more common and pressing workforce needs currently facing state DOTs. The category section of the table maps each scenario to the applicable need categories defined in Section 5.2. The Resource Needs column lists particular resources that are likely to be useful in addressing the need. The first two scenarios are used as real-world examples in Sections 3.3.1 and 3.3.2.

Table 5.1. Current workforce scenarios and associated resource needs.

Scenarios	Workforce Need Category (s)	Associated Resource Needs
<p>The Legislature has passed a retirement incentive bill that gives a 6-month window for eligible employees to retire. The state personnel office estimates that about 5% of the highest paid employees will be eligible. Based on their employees' tenure, the DOT knows that up to 19% of their experienced employees could retire. To complicate matters, a major layoff several years earlier due to budget cuts has left the DOT with few employees experienced enough to take the retirees place if they leave.</p>	<p>Recruitment, retention, knowledge management, training, succession planning, competencies</p>	<ul style="list-style-type: none"> • Competency identification. • Competency based training to address the gaps. • Protocols to retain needed knowledge and ways to make it usable to others. • Methods to determine which of the departing knowledge needs to be retained. • Systems to retain existing key employees. • Succession plans, guides, and procedures. • Methods to target recruitment strategies. • Guidelines for creating a human capital plan.
<p>Consultants who pay higher salaries are making it difficult to recruit engineering technicians. State salary policies limit what the DOT can pay and traditional sources for new engineering technicians can't educate enough people to supply the consultants and the DOT.</p>	<p>Competencies, training and development recruitment, succession planning, outsourcing</p>	<ul style="list-style-type: none"> • Identify required competencies, apart from job titles. • Look for key competencies for these positions in other career types. • Identify other employees in the DOT, other agencies or graduates that are likely to have the needed competencies, and consider recruiting them. • Identify competency gaps in design, and deliver training that addresses the competencies. • Develop mentoring and cross-training to accelerate learning. • Evaluate the position requirements and working conditions and consider changes that make the career more attractive to the workforce. • Target recruitment to attract desired candidates. • Develop a succession plan and career ladders with competency-based promotions. • Consider using contracted services to supplement existing workforce if recruitment is unsuccessful.
<p>Management is complaining about not being able to recruit and retain qualified commercial vehicle compliance officers. The employees who are still working in these positions complain that the job isn't what they thought it would be. The job requires completion of part of the law enforcement academy, but they don't get to do real law enforcement work and some of the locations are in isolated areas. What are the required competencies and how does the DOT find people who are more likely to be satisfied with the work?</p>	<p>Competencies, recruitment, training, retention</p>	<ul style="list-style-type: none"> • Interview supervisors and workers to find out what the satisfiers and dissatisfiers of the job are. • Using collected data in the interviews, are there changes that can be made to improve working conditions? Make reasonable changes. • Create career ladders and cross-training opportunities to build skills and retain employees. • Identify the key competencies for these positions and determine what training would be best. (Does the training atmosphere at the police academy lead the candidates to believe the job is traditional law enforcement?) • Target recruitment to attract candidates likely to be satisfied with the work.

Table 5.1. (Continued).

Scenarios	Workforce Need Category (s)	Associated Resource Needs
<p>An outstanding systems analyst has been hired to manage her former work unit. Her selection was based on performance reviews and her extensive knowledge of systems analysis and computer science. Three month into her tenure as manager, the unit's production has slowed, a harassment suit has been filed, and turnover has increased significantly. Frustrated with her subordinates' poor performance, she works long hours to finish projects. At least there's the satisfaction of a tangible accomplishment.</p>	<p>Competencies, leadership development, succession planning, recruitment, performance management</p>	<ul style="list-style-type: none"> • Identify key competencies for the position. • Use a targeted selection system to determine which candidates have the desired competencies and experience. • Offer orientation to management classes to let interested employees learn about what being a manager entails. • Create a succession plan with appropriate experiences and training to prepare employees for management positions. • Establish a performance plan for the new supervisor to reinforce desired management skills.
<p>The DOT has implemented career ladders so employees in particular classifications can be promoted based on their competencies rather than waiting for positions to open. The benefit to the DOT is having a more versatile and experienced workforce. Promotions are based on testing. A review of the tests shows that some questions are vague; others are not well matched to the position's skill requirements. The tests are used to promote large numbers of employees and are neither valid nor very reliable.</p>	<p>Performance, competencies, training and development</p>	<ul style="list-style-type: none"> • Competency assessment. • Resources to assess questions for reliability and validity. • Position requirement experts to provide input on question content. • Resources and technology for a question bank for each position's test. • Protocols for developing and evaluating performance tests if physical skills are required for the job.
<p>The training director wants to redo management courses because he believes that some of the material needs to be updated to be competency based. He decides to identify desirable management competencies, ways to address them in training and determine ways to get better application of skills learned. His investigation shows poor correlation between what gets a manager promoted in the DOT and what's taught in the management classes.</p>	<p>Competencies, leadership development, training</p>	<ul style="list-style-type: none"> • Competency identification in collaboration with management. • Competency gap assessment at each level of management. • Competency-based training, mentoring and other activities. • Marketing skills to involve management in course development and training of managers where possible.
<p>The DOT brings in a subject matter expert to provide entry-level project management training to employees who are learning to manage projects. The only time the trainer is available is in August—construction season. The managers don't think they can spare the employees who would benefit most from the class on the job. One of the districts sends an experienced project manager who isn't as busy that week and a designer who wanted to take the class. They were asked to come back and tell the others what they learned.</p>	<p>Training, performance</p>	<ul style="list-style-type: none"> • Resources or guidelines to identify competencies covered by the training and expected level of participant expertise. • Assessment process to determine which employees need to acquire the competencies. • Nomination process for appropriate participants.

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Table 5.1. (Continued).

Scenarios	Workforce Need Category (s)	Associated Resource Needs
The DOT has a few employees that have specialized knowledge that can't be found at any price. When they leave or retire how can they be replaced? If you can't keep the workers, why not keep their expertise?	Knowledge management, training retention, competencies	<ul style="list-style-type: none"> • Identify key competencies. • Develop competency-based cross training to employees that are interested in learning the work. • Coaching protocols to help others learn. • Desk manual for the position. • Develop a formal knowledge management system. • Retention strategies—part-time work for retiring employees, formal deferred retirement plans.
The state budget is extremely tight and the Legislature has put agencies under pressure to save the state money and support the economy by outsourcing work. It seems logical to outsource less essential functions and the HRIS, job classification and training functions are outsourced. The cost is lower, but the remaining human resources staff spends significant amounts of time to keep the consultant on track on the classification and training.	Outsourcing, strategic planning	<ul style="list-style-type: none"> • Business plan development and implementation tools. • Guidelines for determining what to outsource (written resources or peer DOT recommendations). • Data to evaluate effectiveness of the service. • Marketing plans to promote value of services.
Some outsourced functions require the vendor's employees to work side by side with DOT employees. The work environment may be tense if the function was outsourced as non-essential or the vendor employees may be a welcome addition to share the workload or complete specialized projects. Either way, employees from different corporate cultures must work together. How can this relationship be made more effective and easier for the workers?	Outsourcing, performance, organizational development	<ul style="list-style-type: none"> • Identify roles of both staffs. • Facilitation methods to get the merged group to sort out working relationships. • Develop common performance goals. • Consistent monitoring system to ensure effective performance.
An experienced manager has been assigned to work with a new unit. Most of the workers are young professionals who want to make an impact on the job. The manager is accustomed to having workers who just do the job. He isn't excited about having to listen to these "kids'" suggestions about improving the work. Turnover has increased dramatically.	Performance, leadership development, organizational development	<ul style="list-style-type: none"> • Guidelines for evaluating and correcting performance problems. • Leadership development activities targeted to the problem (e.g., coaching). • Facilitated meeting to address problems and develop acceptable solutions.
A manager is not pleased with an employee's belligerent behavior and asks the training director to recommend training for the employee as part of the discipline process with the expectation of improvement. The employee has been sent to similar training before.	Performance, leadership development	<ul style="list-style-type: none"> • Methods to identify performance deficiencies. • Evaluation of effectiveness of prior training. • Coaching methods for supervisor to get employee compliance. • Coaching or training in effective discipline.

Table 5.1. (Continued).

Scenarios	Workforce Need Category (s)	Associated Resource Needs
<p>The human resources manager learns about the benefits of succession planning as a means to have a pool of qualified employees in critical positions. A significant number of managers and experienced technical and professional employees could leave over the next few years. How do you decide what skills are and will be critical and how do you design a system that builds competencies without appearing to play favorites?</p>	<p>Succession planning, strategic planning, competencies, leadership development</p>	<ul style="list-style-type: none"> • Succession planning resources and guidelines. • Assistance from peer DOTs that have effective plans. • Resources and methods for collaboration with management to identify critical positions and related competencies. • Strategic human capital management plans. • Gap analysis. • Competency based training and other learning activities. • Processes that allow open application and fair selection of succession plan participants.
<p>The new CEO wants to address managers' concerns about the anticipated large number of retirements and the increased difficulty in finding adequate numbers of qualified employees. The CEO comes from a private business and has seen progressive human resources managers working as partners to management in workforce development with great success. The career managers see the human resources as compliance and record keeping office and aren't excited about the prospects of getting human resources support in building the workforce. When the CEO asks the human resources director about his office's role in executing the DOT's business plan, he's met with a blank stare.</p>	<p>Strategic planning, competencies, leadership development, HRIS, organizational development</p>	<ul style="list-style-type: none"> • Human capital planning protocols and guides. • Key competency identification. • HRIS database to capture competencies, gaps, forecast workforce needs. • Leadership development for career managers and human resources staff. • Facilitated meeting process to develop common goals and a strategic plan including workforce.
<p>Decisions about workforce qualifications, competencies, training needs, recruitment, and selections are often made with limited data, on gut feelings or in response to political pressures, sometimes resulting in human resources functions being outsourced. Without solid HRIS data and effective analysis, human capital planning is weak or non-existent and decisions made aren't necessarily the best ones for the agency. Human resources professionals are not always conversant with business plans and often don't appreciate the power of data in decision making and the necessity for marketing their services.</p>	<p>Strategy, HRIS, competencies, training, leadership development</p>	<ul style="list-style-type: none"> • Resources to create a human capital and workforce plan. • Tools to select HRIS software that meets DOT needs. • Competency identification. • Marketing skills. • Data-based decision making.

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Table 5.1. (Continued).

Scenarios	Workforce Need Category (s)	Associated Resource Needs
A mechanic is seriously injured when a piece of machinery falls on him while he repairs it. The OSHA investigator says it wasn't properly secured and fines the DOT. The shop workload is heavy. Interviews with the shop supervisor and mechanics reveal that they are routinely asked to "do whatever it takes" to get the work done even if it means using substandard equipment and taking shortcuts. It turns out that this means of doing business isn't confined to the one shop. How can a safety culture be instituted?	Organizational development, leadership development, training, performance, competencies	<ul style="list-style-type: none"> • Analysis to identify organizational culture issues. • Processes and peer DOT assistance in motivating effective safety behavior. • Coaching, example setting, rewards for appropriate behavior. • Training on proper methods. • Disciplinary methods for non-compliance. • Assessment of appropriate staffing levels and competencies.
The state has purchased asset management software that includes modules for inventory of capital purchases. Many people will need to be trained to use the software. Some of the positions that would be using it are lower paid, higher turnover so it's important to have reference materials and just-in-time training. The software vendor will provide the training, but it's generic and fairly expensive. How should the training be accomplished?	Training, competencies	<ul style="list-style-type: none"> • Identify competencies required to operate software. • Identify existing staff competencies. • Develop training content and methods consistent with needs in cooperation with vendor for new material if necessary. • Identify appropriate training delivery methods.

5.4 Workforce Trends

This section identifies current workforce trends and their implications for emerging workforce needs. Workforce need categories from the framework are identified, and types of workforce resources that would likely be helpful to meet the needs are listed (Table 5.2).

5.5 Future Trends

While many of the trends and needs currently facing state DOTs will continue for the next 5–10 years, there will also be new emerging trends that will impact workforce needs. This section discusses the implications of these emerging trends, organized by the need categories of the framework.

Compensation and Benefits. Historically, prospective employees could assume baseline benefits such as health insurance and retirement. Public sector organizations could offer an attractive benefits package to offset lower wages when compared to the private sector. If state DOTs are to continue attracting and retaining a quality workforce, they must find ways to offer a combination of wages, benefits, and other non-salary compensation that appeals to appropriate job candidates.

Competencies. Currently competencies are used primarily to identify and develop training needs and programs, as well as to identify the requirements for various occupations. If competencies are to ultimately achieve wider use they must become both more standardized and more easily adjusted when specific work requirements emerge.

Downsizing/Reductions in Force. As the capabilities of information technology expand and the economy shrinks, organizations will need to do more with fewer people, and those people will need a variety of skills and characteristics to remain effective in the face of change.

Table 5.2. Implications of current workforce trends for workforce needs and resources.

State DOT Trends	Implications for Workforce Needs (Need Category)	Associated Resource Needs
More work to be done than resources to accomplish	<ul style="list-style-type: none"> • Methods to prioritize programs and the work associated with the programs (Performance Management) • Need for organization structures that facilitate efficient and effective decision making (Organizational Development) • A culture of performance (Performance Management) 	<ul style="list-style-type: none"> • Strategic planning and management process which identifies the most important programs, the desired outcomes and the financial and human resources required to achieve goals. • Principles of efficient and effective organizational design. • Delegations of authority manual that emphasizes decision making at the lowest possible level. • A performance management system and accompanying incentives to reinforce the value of effective, efficient performance.
The rapidly changing nature and content of work	<ul style="list-style-type: none"> • Revised business processes (Organizational Development) • Assistance to help adjust to the changed business processes (Organizational Development) • Revised competencies to reflect changing work (Competencies) • Build transferable competencies (e.g., teamwork, communications) 	<ul style="list-style-type: none"> • An automated tool which maps business processes easily. • Training in the new business processes and to understand nature of and reason for change. • Marketing and facilitation resources to get buy-in from affected parties. • Automated resource for tracking competency requirements and the changes made to those competencies.
Loss of leadership and technical “brain trust” through retirements	<ul style="list-style-type: none"> • Well qualified replacements (Leadership Development, Succession Planning) 	<ul style="list-style-type: none"> • Workforce planning resource which anticipates retirements. • Succession planning process to identify leadership needs. • Leadership development training which assures an available source of qualified candidates from which to choose. • Supervisor, manager, executive recruitment process that assures an efficient and effective recruitment and selection process.
A new technology substantially changes the traditional methods of accomplishing work	<ul style="list-style-type: none"> • Assure the workforce acquires the skills to use the new technology appropriately (Competencies, Training and Development) 	<ul style="list-style-type: none"> • Automated tool for tracking competency requirements and the changes made to those competencies. • Business process analysis tool which identifies which human resources programs must be changed, e.g., competencies, recruitment, training. • Training needs analysis methodology and automated system for conducting analysis. • Learning Management System to track, support revision of training products and track who needs and has received the retraining. • Outsourcing resources when talent can’t be hired.
A new program mandated by the legislature requires hiring a new occupational category	<ul style="list-style-type: none"> • Determine how to best acquire the workforce (Competencies, Outsourcing) • Develop and execute recruitment strategy and plan (Recruitment) 	<ul style="list-style-type: none"> • Workforce planning resources to define specific needs, analyze potential sources and methods, e.g., direct hires, contract out, or a combination. • Competency analysis to identify requirements and existence of needed competencies in current workforce. • Method for developing and executing recruitment strategy and plan.

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Table 5.2. (Continued).

State DOT Trends	Implications for Workforce Needs (Need Category)	Associated Resource Needs
Increasing employee turnover through retirement and voluntary resignations	<ul style="list-style-type: none"> • Retain well qualified employees (Retention) 	<ul style="list-style-type: none"> • Methodologies and guidelines to estimate cost of turnover. • Exit interview program to ascertain why employees leave and guides to fix problem areas. • Financial and non-financial incentives to retain needed competencies. • Supervisor, manager, executive training to assure that the organization has a culture which attracts and retains the best talent.
Within 5 years, 40% of the workforce is eligible to retire	<ul style="list-style-type: none"> • Retain needed organizational knowledge (Knowledge Management) • Human capital planning (Strategic Planning) 	<ul style="list-style-type: none"> • Competency analysis to determine what capabilities should be retained for the organization. • Workforce planning tool to provide “what-if” scenarios of how and when those eligible might leave. • Strategy and plan for retaining the needed knowledge. • Recruitment and employee development programs to assure needed knowledge retention. • Written and oral histories (in accessible form) of the experts whose knowledge will be lost through retirement. • Human Resources flexibilities, e.g., reemployed annuitant authority to rehire those who retire for 1–3 years.
Downsizing and outsourcing of DOT function	<ul style="list-style-type: none"> • What competencies must be retained or strengthened (Competencies) • Human capital planning (Strategic Planning) 	<ul style="list-style-type: none"> • Analysis to determine what are essential government/DOT functions. • Organizational development resources. • Competency analysis to determine essential capabilities to retain internally. • Conduct due diligence on options for contracting out. • Multisector workforce plan to identify what will remain within DOT and what will be contracted out and to whom. • Contract administration resources.
Establish a culture of performance to enhance productivity and customer service	<ul style="list-style-type: none"> • Hold leadership accountable (Leadership Development, Performance Management) • Holding employees accountable (Performance Management) 	<ul style="list-style-type: none"> • Performance management program which defines culture of performance responsibilities of leaders. • Training program for leadership on these competencies and requirements. • Performance incentives which reinforce desired behaviors and achievements.
Improved efficiency and accountability for human resources services/processing	<ul style="list-style-type: none"> • Human resources strategy and business planning (Strategic Planning) • Data-based decision-making (HRIS, Strategic Planning) • Resources to support human resources operations staff (HRIS) 	<ul style="list-style-type: none"> • Business process review, analysis, and revision. • Methods for identifying system requirements. • Methods for identifying related policies, procedures, systems, e.g., payroll. • Workforce planning to identify needed resources to staff HRIS project. • Budget analysis to determine financial resources required. • Training programs to teach human resources and other staff and managers how to use new system and its resources. • Metrics to judge success of various stages of project.

Employee Conflict. The degree of employee conflict in the workplace will increase and decrease based on such issues as the presence or absence of well qualified supervisors, managers and executives, the degree of stress within the working and personal lives of employees and their family members and the more general cultural norms of the United States. The most successful organizations will continue to understand that making employee assistance programs available to those who are experiencing work related or personal stress in their lives is a good investment, which enhances the quality of work life for all employees and contributes significantly to enhanced organizational productivity.

Human Resources Information Systems (HRIS). We are just at the beginning of the application of the power of information technology to human resources policies, programs, procedures, and practices. As HRIS is refined and becomes more responsive to organization needs, much of the operational and compliance work currently done by Human Resources Departments will be automated in whole or in substantial part by information systems. This means that HR employees must learn to harness the power of information technology systems and identify the decisions and activities that truly require human intellect and ingenuity. This transformation will not result in the need for fewer human or fiscal resources for Human Resources Departments. Rather, it does mean that human resources competencies and activities will be substantially different than they are today. As social networking technologies become more developed and pervasive, the power of this technology will also need to be captured and developed for use within organizations. This includes the ability of human resources staff to use data for strategic workforce planning. Balancing the need for data security and ease of access to data will continue to present challenges for organizations.

Human Resources Function. The basic human resources functions of recruitment, hiring, placement, promotion, rewards and benefits will continue to be the foundation functions of any top quality human resources program and the key to an organization's ability to attract and retain a well qualified workforce. In addition, we can expect to see substantial change in the next decades in issues such as the impact of automation on both how work is done and where it is done, on the types of employee-employer relationships that exist, and on quality of work life issues. For example, most organizations still believe that most employees must be in a designated physical workplace that is within the physical sight of the supervisor. Virtual organizations will become well accepted in the next 15–30 years, as will the notion of networked organizations. "Networked organizations" refers to individuals from different parts of a single organization, or individuals from a number of different organizations, working together virtually or physically, to accomplish assignments of importance to the organization.

Human Resources Planning. Linking human resources policies, programs, and procedures to the agency's strategic plan and objectives will become commonplace. Every organization will have the planning capacity to assure that its human resources are aligned appropriately with current program priorities and that it has the planning capacity to anticipate in three, five or ten year cycles what the human resources needs of the organization will be. This planning capacity will be supported by appropriate technology which will enhance the forecasting capabilities of agencies and their human resources programs areas.

Knowledge Management. Public organization will make slow but steady progress in understanding how to identify their knowledge management needs, and how to organize knowledge for the maximum benefit of the organization, employees, customers, and stakeholders. Most public organizations are just beginning to understand how important managing knowledge is to assuring a quality workforce and quality work products. In the 21st century, public organizations will come to understand that knowledge management is an essential competitive advantage as they compete for the best talent for their organizations.

Leadership Development. Lessons learned over the last 30–40 years, particularly about the failure to develop enough talented leaders, dictates that leadership development programs and activities will be paramount during the next 5–10 years. However, as information technology reduces the need for hierarchical organizational structures, leadership development and training should occur at every organizational level. A key competency for successful leadership development and training will be facilitation of the associated change of culture from a traditional hierarchical organization to that of a more networked structure. In addition, the complexity of solutions will demand that leaders are able to assemble and utilize teams of individuals within and outside their organizations. Finally, the cost of leadership development (as well as other organizational fiscal demands) in a season of scarcity will demand rethinking of how leadership development occurs. For example, Gallup Organization and ASTD research suggests that proactive leadership development training to enhance individuals' strengths provides a greater long term return on investment than development which seeks to cure an individual's leadership weaknesses.

Organizational Change. At the beginning of the 21st century, most public and private organizations still retain the hierarchical, and relatively rigid, organization structures, policies and processes which have existed since the 19th century. As technology tools make horizontal and vertical collaboration easier, and make networked teams and similar constructs possible and essential, organizational change will take on a whole new meaning. Contributing to this increased pace of change will be the demand from citizens and legislatures that organizations be more effective and efficient as increased demands for service compete with a continuing scarcity of resources to meet those demands.

Organizational Development. Because of increasing demands in relation to scarcity of availability of resources to meet those demands, an organization's processes and methods for developing its internal capacities to help assure its current and future success in accomplishing its strategic goals and objectives will also become a necessity. This need will be exacerbated by such issues as the following:

- Increased use of information technology systems and resources,
- The presence of three to four generations of workers in the workforce,
- Pressures forcing social networking within and outside the organization, and
- The scarcity of sufficient numbers of individuals in the labor pool to meet workforce needs.

Organizational Performance. The talk of measuring organizational performance will be replaced by the reality of measuring organizational performance. The development of strategic plans and objectives, and the metrics to assess performance against those plans and objectives, will provide the framework for true assessment of organization performance. This will require the linking of substantive program objectives and plans with the human, fiscal and material resources required to support accomplishing the established goals. To achieve this outcome, employee performance and organizational performance must be related. Ultimately, organization performance will be measured on ultimate outcomes. For example, the DOT will be judged successful if it provides an inter-related transportation system effectively and efficiently, not just did it build this road, or that bridge.

Outsourcing and Contract Management. Multi-sector workforce planning that merges planning for direct hires with acquisition of talent from all other sources will be a necessity. Organizations that choose to acquire needed goods and services from other providers will need to assure that they have the talent within their organizations to exercise the proper due diligence and oversight of the contracts and other arrangements of acquiring goods and services from external sources.

Performance Management. Managing organization and individual performance will be seen as two halves of the whole rather than two separate and distinct programs and processes. This merger necessitates aligning the strategic plan goals and outcomes with organization and individual performance requirements. This will also necessitate the rethinking of the following:

- How performance requirements are articulated and measured.
- The financial and non-financial incentives that encourage the performance culture that an organization wants and needs to accomplish its strategic goals and objectives.

It will also require assuring that both supervisors and employees are trained to understand how all of these pieces work together.

Recruitment. Recruitment policies, programs, and procedures will continue to be streamlined and targeted to interests of candidates with the desired skills. Recruitment is likely to be broadened to focus on sources of skill sets rather than just traditional sources of candidates. Applications for positions will be almost wholly Internet-based, which means state DOTs will need to substantially enhance both their web-based recruitment tools as well as the capabilities of their staffs to use those resources.

Retention. The U.S. Bureau of Labor Statistics (BLS) predicts that by 2030 the labor pool will increase at a rate of approximately one-third of 1% a year. This compares to an early 21st century labor pool growth rate of approximately 1.2% per year. Assuming a reasonable economic growth rate, it is clear that the competition for well-qualified candidates will be at a premium. To retain the best employees, organizations will need to provide interesting work that allows employees to make both substantial contributions and to grow and develop professionally. A critical success factor will be well trained and experienced executives, managers and supervisors—the organization’s leadership cadre—who can direct these activities and assure that well qualified employees are retained. In addition to creating a creative and performance based work environment, leaders will need resources to assist. These resources include financial and non-financial recruitment and retention incentives, employee development opportunities, well defined career ladders and career paths and similar resources. In addition, organizations will need to conduct exit interviews of those who leave, provide a wide variety of work-life programs such as alternative work schedules, and use similar analytical tools and programs to assure that the work place and the work are of a level that allows the organization to retain the talent it has competed for.

Retirement. The baby boomers are already redefining retirement, and this trend will continue. For the first time in its history as a nation, the United States will have workforces which encompass as many as four generations of employees. This will require rethinking retirement benefits and work arrangements. For example, most public and private organizations still require employees to be full time or part time. They do not have the concept of a “step down” employment arrangement where individuals can work anywhere from 40 hours per week to 30 hours per week to 20 hours per week in a structured, predictable way. This type of change will require rethinking the nature and structure of work and positions. However, this type of change could also contribute significantly to such issues as knowledge management, if organizations put a premium on capturing and sharing the knowledge of the senior workforce with its more junior members.

Strategic Planning. Strategic plans will become an organizational necessity because demands on state DOTs will continue to increase at an exponential rate while available fiscal and human resources will increase at a substantially slower rate. The strategic plan will be the initial process and instrument through which state DOTs identify program priorities to receive scarce fiscal and human resources. Strategic planning will be strengthened with a stronger focus on strategic management—implementing the plans with actions that support the plan.

Succession Planning. As discussed above, the scarcity of human and fiscal resources in an environment of increasing complexity necessitates identifying individuals to replace those who will leave the organization. Succession planning will be needed for positions at all levels of mission critical occupations.

Training and Development. State DOTs will need to substantially increase their understanding of which training delivery mechanisms provide the greatest level of learning for the least cost. The effectiveness of computer based training and other less formal means will need to increase substantially and will need to be more tailored to the content needs and different learning styles of students. In addition, there will be (and should be) greater pressure to share training resources and development costs between and among state DOTs and other public employers.

Workforce Planning and Development. Planning for workforce needs and assuring that the workforce has the opportunity to continually develop its skills and competencies will be two factors that are critical to success over the next quarter century. Competition for well qualified staff will continue to be a challenge for state DOTs. Those organizations that invest in analyzing what type of workforce is needed will be able to make better use of scarce dollars and will be able to increase the likelihood that those individuals who are hired are the right people to maximize production.

The rate of new knowledge creation is predicted to continue to increase exponentially. This requires that organizations create a workforce development strategy and plan for assuring that the workforce acquires the new knowledge necessary to achieve its strategic goals and outcome, and can do so with greater efficiency and effectiveness.

Other. Driven by rapidly changing technology, the explosion in knowledge, the scarcity of human and fiscal resources in relation to continuing growth in demand for goods and services, quantitative analytical tools, and the development and use of data-driven decision making will become the norm. Analysis assessing both the qualitative and quantitative return on investment (ROI) for all workforce decisions will become paramount.

Review of Existing Resources

6.1 Introduction

A rich collection of resources is available to help DOTs meet current and future workforce needs. Several recent research projects have addressed a variety of strategies spanning the workforce life cycle from recruitment to succession planning. In addition to research reports, web sites exist for the exchange of information, resources are available from organizations outside of the transportation sector, and a wide range of tools have been developed by vendors. Materials and research reports from professional organizations, human resource consulting firms, and academic sources offer up-to-date information and resources to address workforce issues and organizational performance.

The challenge in this project was to identify those resources that are most useful and applicable and match them to the specific needs of state DOTs. A database of information resources was assembled through an extensive search of available literature and a review of this literature to identify resources of interest. Resources were selected for inclusion in the database based on relevance to the needs identified in Chapter 2 and practical applicability. Resources judged to meet this latter criterion included case studies or examples of successful DOT practices and models, methodologies, solutions, or other resources that could be adapted for use within a DOT setting.

While many of the resources identified are available in electronic form on the Internet, access to some of the resources listed in the database is restricted to members—for example publications from SHRM and the Conference Board. However, these reports and other resources can be legally accessed through libraries that maintain database subscription services. For example, Conference Board, SHRM, and ASTD publications can be downloaded through the Wilson Full Text Business Database and LexisNexis. Some on-line publications that address public sector management issues such as *Governing* can be accessed from their web site <http://www.governing.com>.

University research centers such as the Cornell University Center for Advanced Human Resource Studies, and the Boston University Human Resources Policy Institute provide extensive reports on workforce issues in the private and public sector. These materials can be purchased from the centers and some materials from university research centers and professional organizations are available through libraries as well. Collateral material referenced in some publications such as CD-ROMs, hard copies of reports and manuals, and survey instruments generally have to be purchased.

6.2 Existing Resources Evaluation and Organization

Using resources from the sources defined above, as well as new resources discovered or contributed by team members during the development of the Workforce Toolkit, the researchers developed a system for organizing and tagging documents. This system was designed to match the most relevant resource to the needs defined in Chapter 5.

The first step involved identifying who might be searching for resources and what parameters or standards they would deem necessary. To define “who,” the researchers categorized resources by audience and by DOT role. Resources were also tagged by source (state DOT, University research center, journal, etc.) or resource type (case study, software application, etc.). Specifics were then defined within the following categories:

Audience Type:

- General Public Sector,
- General Private Sector,
- Human Resources,
- State DOT,
- Training and Development,
- Transportation Professionals,
- Other, and
- Other Industry.

DOT Role:

- Human Resources,
- Line Managers/Workgroup Supervisors,
- Senior Managers (division chiefs and district administrators),
- Top Agency Executives (CEOs), and
- Other.

Source Type:

- Journal/Publisher,
- NAPA,
- National Association—Human Resources,
- National Association—Public Administration,
- National Association—Transportation,
- State DOT,
- Transportation Research Board/National Cooperative Highway Research Program/TCRP,
- University Research Center,
- USDOT,
- Other State Agency, and
- Other.

Resource Type:

- Case,
- Consulting Service,
- General Resource,
- Measurement/Assessment Tool,
- Methodology/Guide/Model,
- Organization,
- Policy/Procedure,
- Software Application, and
- Other.

These categories and the need types identified in Section 2.3.1 became the facets used to tag the documents in the database. Every resource is tagged with some combination of facets. The Top Ten DOT Workforce Needs view, the Frequently Asked Questions view, and the Functional View of Workforce Needs all retrieve resources from the database that have been pre-tagged with facets that identify them as relevant to the need presented within the view. The Faceted Search view allows users to select their own combination of facets. Text Search accesses the same data

base as the views discussed above but allows the user to search based on a word or combination of words. The Geographic View and State Practices view access different databases; the searches for these views are pre-programmed. Home returns users to the Workforce Toolkit home page. The Forum and Video views connect to resources outside the Toolkit.

6.3 Summary of Applicable Resources

Currently the resource database contains over 275 resources. Table 6.1 shows the number of resources by need category. Note that some resources address multiple need categories, so summing the figures in the “Number of Entries” column results in a number greater than the number of resources.

The following link connects to the Workforce Toolkit: <http://146.115.18.166/Workforce10a/NCHRP.aspx>

The URL and the web site were developed as a demonstration of the Workforce Toolkit. Their availability following completion of the NCHRP research project is supported only by the research team.

6.4 General Sources/Organizations That Provide Multiple Resources and Tools

The research team reviewed several organizations that maintain web sites providing access to regularly updated information on a variety of leadership, strategic human capital planning, and other human resources topics. While these sites are not geared to DOTs, the resources they offer are relevant to the DOT workforce needs outlined in section 2.3.1. These sources were chosen for inclusion because they offer a rich and dynamic set of materials, including practical resources and methodologies. Some sources are focused on specific workforce issues—for example, the

Table 6.1. Resources by workforce need category.

Workforce Need Category	Number of Entries
Strategic Planning	12
Organization Development	13
Human Resources Information Systems	12
Retention	40
Compensation and Benefits	21
Downsizing/Reduction in Force	13
Retirement	8
Workforce Planning and Development	50
Organizational Change	19
Leadership Development	21
Human Resources Planning	12
Organizational Performance	17
Human Resources Function	20
Employee Conflict	4
Competencies	22
Recruitment	61
Succession Planning	12
Outsourcing/Contract Management	10
Training and Development	50
Knowledge Management	17
Performance Management	21
Other	22

American Society of Training and Development (ASTD) addresses training and development workforce needs; the International Society for Performance Improvement (ISPI) addresses performance improvement issues for organizations and individuals. Other organizations, such as the National Academy of Public Administration (NAPA), the General Accountability Office (GAO), and Cranfield University's School of Management address the full spectrum of public workforce needs and solutions. All of these organizations are recognized throughout the world as providing efficient, effective, and practical solutions to workforce needs.

Specific sources identified of relevance to the Workforce Toolkit include the following:

American Society for Training and Development (ASTD)

www.astd.org

The American Society for Training and Development is the most prominent of the professional organizations for continuous learning information. They are also a source of information about online or e-learning. ASTD publishes monographs and periodicals on a wide range of training and development resources as well as research on training methodologies.

American Society for Human Resources Management (SHRM)

www.shrm.org

SHRM is the best of the professional organizations dealing with private sector human resources issues. Some state chapters also have public sector interest groups that develop programs specifically for human resources practitioners in the public sector. They have an excellent research department doing cutting edge human resources research.

Brookings Institute

www.brookings.edu

The Bookings Institute is a non-profit organization that has a wealth of research and knowledge about public policy issues, including human resources management issues.

Cranfield University School of Management

www.som.cranfield.ac.uk/som/

Cranfield is a leading British university that has cutting edge research on international human resources issues.

Council for Excellence in Government (CEG)

www.excelgov.org/

CEG works to improve the performance of American government and government's place in the lives and esteem of American citizens and others around the world.

Human Resources Institute (HRI)

www.hri.org

HRI is a consortium of several hundred private sector firms that pool their resources to conduct research on human resources issues that are expected to confront organizations several years in the future. It is an excellent resource for identifying future issues of concern to organizations.

International Personnel Management Association (IPMA)

www.ipma-hr.org

IPMA provides access to a wide variety of human resources workforce tools and assessment methods from around the world. Its research is excellent. IPMA has done a particularly good job identifying the competencies required for human resources positions and functions.

International Society for Performance Improvement (ISPI)

www.ispi.org

ISPI is the leading international association dedicated to improving productivity and performance in the workplace. Its mission is to advocate the use of Human Performance Technology. In addition to the annual Conference and Expo and other educational events it publishes books and periodicals, and supporting research.

National Academy of Public Administration (NAPA)

www.napawash.org

The Academy provides extensive studies on human resources management public sector issues and trends. The web site also provides access to general management studies, environmental studies, organization performance improvement studies and the like.

National Association of State Personnel Executives (NASPE)

www.naspe.net

The National Association of State Personnel Executives (NASPE), a non-profit organization, was established in 1977 to enhance communication and the exchange of information among personnel executives. NASPE is an affiliate organization of The Council of State Governments. NASPE has an excellent list of additional electronic sites and references for human resources issues.

Organization of Economic Cooperation and Development (OECD)

www.oecd.org

The OECD is a leading researcher on international human resources issues. The studies, tools, and successful practices are developed and applied throughout the world.

The Center for Creative Leadership (CCL)

www.ccl.org/index.shtml

The Center for Creative Leadership is an international, nonprofit educational institution. Its leadership programs and practices are among the best in the world. CCL research is developing models of managerial practice that can prove useful to state DOTs.

The Conference Board

www.conference-board.org/

The Conference Board creates and disseminates knowledge about management and the marketplace to help businesses strengthen their performance and better serve their customers. It also provides information on consumer confidence, leading economic indicators, and the Consumer Confidence Index.

U.S. General Accountability Office (GAO)

www.gao.gov

The GAO is the U.S. government's auditor and a primary developer of workforce assessment tools. It provides reports on agency and program performance. It is an excellence source of information on human capital management, organizational and individual performance management, metrics and similar topics.

U.S. General Services Administration (GSA)

www.gsa.gov

The GSA is a U.S. government agency that leads the government's telework and mobile office research and successful practices. It also provides information about technology needed to establish telework and mobile offices.

U.S. Office of Management and Budget

www.omb.gov

The OMB is a U.S. government agency that leads the federal government's organizational performance research and successful practices. The Performance Assessment Rating Tool (PART) is an excellent analytical methodology for assessing the effectiveness and efficiency of a government program. OMB also provides resources for evaluating information technology programs and systems.

U.S. Office of Personnel Management (OPM)

www.opm.gov

The OPM is the U.S. federal government's central human capital management authority. The web site has information on every human capital management topic.

6.5 Gaps in Resources Available to Meet Workforce Needs

This section discusses gaps between the workforce needs that were identified in section 2.3.1 and the current resources available to state DOTs to help them address these needs. Both current gaps and likely future gaps based on emerging trends are identified.

6.5.1 Gaps Related to Coverage by Need Category

As shown in Table 6.1, the research team was able to locate a reasonable number of useful information resources within each of the 22 identified needs categories. Categories with the greatest coverage included Workforce Planning/Development, Training and Development, and Recruitment. Categories with relatively few resources identified included Retirement, Downsizing/Reduction in Force, Employee Conflict, and Outsourcing/Contract Management. Materials on Strategic Planning, Human Resources Planning, and Knowledge Management within DOT settings also have relatively light coverage in the database.

6.5.2 Gaps Related to Specific Emerging Workforce Issues

Linking Strategic Business Planning to Strategic Workforce Planning. While general resources on strategic planning processes were identified, there is a need for more targeted materials that help DOTs make progress in the integration of strategic workforce planning with broader strategic business planning initiatives. Materials on this topic are needed both for human resources professionals and for agency executives. Materials for human resources professionals would help to enhance their understanding of business strategy and planning and their human resources role in supporting those areas. Materials for executives would provide a succinct understanding of how good strategic workforce planning can be an important driver of long-term organizational effectiveness.

Workforce planning resources that incorporate all aspects of the multi-sector workforce will be essential given the evolving models for the acquisition of talent to achieve strategic goals and objectives. Policies, methods, and other resources to assure that the state DOTs maintain the technical expertise to properly oversee the goods and services provided by the multi-sector workforce will be a continuing challenge.

Balancing a Shrinking Workforce with an Increasing Workload. Retirements and reductions in force due to economic constraints can increase employee stress and potentially undermine long-term business planning. Case studies, policies, and guides that can help guide human resources professionals through the preparation, execution, and repercussions of a reduction in force can ensure that DOTs reduce employee conflict, maintain a positive work environment, and that the agency is prepared to meet future safety and quality standards.

Reduced workforces and budgets have caused many agencies to outsource work to contractors. This practice creates the need for a new skill set—contract negotiation and management—as well as for tools to assess the costs and benefits of outsourcing. It also creates the need to carefully consider the costs and benefits of direct hire versus acquisition of talent, goods, and services through contracts and similar vehicles. Software applications that display comparative data analyses, consulting services, model requests for proposals or contracts, and other informative resources can help agencies utilize outside contractors in the most cost-effective and efficient manner possible.

Leadership Development. A need exists for additional resources that address development of the next generation of DOT leaders. Currently, middle management gaps exist in many DOTs

due to hiring freezes that were in force during the 1990s and the movement of management candidates from DOTs to private companies. Resources of all types can assist DOT managers in identifying potential future leaders and training them in the changing requirements for successful leadership.

Succession Planning. There is a need for a richer base of case studies and models for fully integrating succession planning processes into the fabric of the organization, and for demonstrating concrete approaches for flagging areas of risk or exposure.

Competency-based Training and Development Programs. There are good generic toolsets and methodologies available for competency definition and assessment, but relatively few good examples of practical approaches to training and development investments to proactively and systematically fill identified gaps in required competencies. There is also a need for examples of methodologies for ROI calculations that can be used to determine when training investments make sense. These ROI approaches should be broadly based, taking into consideration issues such as dollars expended, competency acquired and applied, short-term and long-term impact on organizational and individual performance, and similar complex factors.

A second need with respect to competencies is resources which simplify and standardize identification of competencies specifically related to DOTs and that provide resources to assess and predict the relationship between competencies in place and successful employee and organizational performance.

Recruitment. There are resources that more directly address recruiting challenges faced by today's DOTs given a shrinking candidate pool, changes in what DOTs are able to offer with respect to compensation, and changes in what motivates and attracts candidates to DOT jobs.

Human Resources Information Systems. There are resources that enable human resources professionals to articulate requirements for improved tracking and reporting and work toward successful realization of these requirements as part of system acquisition and development efforts that are enterprise wide or statewide in nature.

Performance Management. There are resources that help DOTs to shift to a culture that unites organization and employee performance requirements, metrics, and assessments. Creating, managing, and evolving the required culture of performance within state DOTs will require the development and absorption of an entirely new set of executive, manager, and supervisory skills. It will also require a substantial evolution of the employee-employer relationship with all the myriad implications for the devolution of greater power to individual employees and the need to establish a proper set of checks and balances to manage that evolution and delegation.

6.5.3 Gaps Related to the Type of Information Resource

Policies and Procedures. Strong interest was expressed by DOT human resources leaders (at the AASHTO human resources meeting in Portland, Oregon, in May 2007) for inclusion of model Human Resource policies addressing a broad range of workforce issues in the database. In response, the research team gathered relevant model policies from the public and private sector and included them in the Workforce Toolkit. There are currently 22 policies/procedures in the database in addition to 100 methodologies/guides/models.

Lessons Learned and Successful Practices. A second comment expressed at the AASHTO human resources meeting was the need for sharing of real-time information on successful practices and lessons learned. For example, if states are moving toward outsourcing of DOT functions, what policies are being used for the employees whose jobs are impacted? What did state X which

did this last year do? There is currently no central, reputable source that provides this type of information. Certainly the sources identified above, as well as the web sites of TRB and its subsidiaries such as NCHRP provide a wealth of information, some of which focuses on successful practices and lessons learned. However, there has previously been no “one-stop shopping” for this type of information. In an era of rising demand for services and a shrinking resource base to provide those services, a portal which provides this type of information will be invaluable. To address this gap, the researchers added the State Practices view, which links users to a table containing information from recent NCHRP reports that involved individual state case studies or examples. More information can be added to this view as it becomes available.

Testing Process

The Workforce Toolkit prototype has undergone two phases of testing.

7.1 Alpha Test

An alpha test of the Toolkit was conducted with the project panel in April 2008. A demo of the toolkit was conducted via web conferencing. Panel members were encouraged to access the application via a web link and provide comments. The research team also used the April 2008 AASHTO Subcommittee on Human Resources conference in St. Louis, Missouri as an opportunity to get input and early testing of the prototype Toolkit. An introduction to this project and the prototype Toolkit itself was provided at the conference at a plenary session. Session participants provided input on the prototype.

As a result of input from this testing, the research team recognized that the Toolkit needed to be structured to incorporate a broader set of resources, including the following:

- Descriptions of current practices that have proved to be successful (e.g., who has established new compensation policies that address recruiting of engineers in a tight market). In response to this input, the research team collected a sample set of practices for inclusion in the resource database.
- State DOT policies and procedures for topics related to workforce management. Most state DOTs have a policies and procedures manual for employees. They typically also have documents specifically related to recruitment, compensation and benefits, succession planning, and other topics. To address this concern, the research team collected a sample set of practices for inclusion in the resource database.
- Organizations whose primary purpose is to support workforce management topics. Most provide access to a wealth of resources related to workforce topic areas of concern to state DOTs. In response to this suggestion, additional organization resources were added to the existing sample set in the database.

7.2 Beta Test

The second phase of testing, conducted in October 2008, involved comprehensive review of the prototype by 26 individuals. Fifteen reviewers were members of the panel. Of the remaining 11 individuals, 4 were human resources professionals, 4 were volunteers from the 2008 AASHTO Subcommittee on Human Resources Conference that was held in St. Louis, Missouri, and 3 were transportation professionals from state DOTs suggested by panel members from their organizations. Testers were given 2 weeks to respond, and were asked to enter their input in a survey instrument available on the web.

7.2.1 Test Design

Direction for the beta testers included an outline of the scope of the project, including the intended audience. Testers were informed that they were previewing a prototype application that demonstrates the functionality needed for a Workforce Toolkit, and that the application had not undergone the design and testing process required in a robust software application. Additionally, they were notified of situations, such as the geographic view, where real data is not yet available. They were also informed that AASHTO will be hosting the application after the project is completed and that AASHTO will work with the human resources Subcommittee on Human Resources to determine the level of data completeness.

Testers were provided the link to the Toolkit and asked to walk through the application with the aide of the User Guide available from the site. Specific questions included the following:

- Is this web site useful for your needs? Please explain why or why not.
- Which view will be most helpful to you? Least helpful?
- Do you find this web site easy to use? If not, please explain why.
- Do you recommend any changes to the design or layout of this site (please specify)?
- Are the overviews, descriptions (short and long), and resource description types helpful? If not, please explain why.
- Do you find the resources that are listed for the category selected useful? If not, please explain why.

Testers were also asked to notify the research team if they encountered any problems while using the application (i.e., the application stops functioning/freezes, the results being shown do not match the category, etc.).

7.2.2 Test Results

Of the six respondents using the survey instrument, all replied the Toolkit was useful. Comments included observations that it was easy to use, well organized, and contained relevant information.

The majority of testers identified the Top Ten DOT Needs as the most helpful view, with one respondent indicating that it distills the most relevant and necessary information. The Faceted Search view and Functional View were also popular. Text Search and the FAQ were each mentioned as helpful by one tester. Two respondents felt the Geographic View was least helpful, which may relate to the fact that the view currently does not contain accurate data. State Practices, Faceted Search, FAQ, and Forum were all identified as least useful by at least one respondent; one tester mentioned that the Forum view and Video view would be “a nice bonus.” The fact that one tester found a view most helpful while another identified the same view as the least helpful indicates the value of offering a variety of search approaches.

Five testers replied that the descriptions were helpful and well written. The sixth respondent did not reply to this question.

Beta testers offered additional feedback on the Toolkit through the survey instrument, by email, and by phone. The research team categorized this feedback by type—programming, editorial, content, question—and determined what actions—to address, to include as a recommendation for future versions of the site, to address in final report—were appropriate within the scope of the project.

Conclusions and Recommendations

8.1 Conclusions

This research project has produced a Toolkit that can be used by state DOT leadership, managers, and human resources staff “to address workforce challenges in the following areas:

- Characterizing and assessing core competencies of the agency’s personnel, which are likely to be influenced by changing demographics, staff turnover, attrition, and competition from other employers.
- Characterizing and assessing the need to preserve institutional history and other mission-critical knowledge held by current personnel.
- Recruiting diverse staff to ensure needed competencies are in place to meet future demands.
- Educating, training, and developing staff to attain needed competencies, institutional history, and other mission-critical knowledge.
- Succession planning to ensure availability of highly competent and qualified personnel to fill key technical management and leadership roles at all levels of the organization.
- Retaining staff to maintain productivity.
- Ensuring an adequate and diverse supply of qualified entry-level personnel to meet mission-critical requirements in the future.”

While the original research plan envisioned development of a hyperlinked document as the major research product, one of the key conclusions of the initial phase of work was that a static guide would be quickly outdated. It was therefore decided to implement a prototype of a web-based tool that could be more easily updated over time. The research team also developed supporting information, including a list of resources state DOT managers, leaders, and human resources staff can use to address workforce challenges; a gap assessment of areas where there are insufficient resources to meet specific needs; and guides to the user and administration sites for the tool.

Within the scope of this project, the research team explored the use of information technology as a means to address knowledge needs. They discovered that existing technology supported the development of a flexible, extensible tool to deliver important information about responding to workforce issues to the individuals with state DOTs who need it most. The web-based tool the team developed connects users to a diverse set of resources that may be helpful to DOTs seeking to address workforce challenges. The tool consists of multiple views that provide different ways of accessing relevant resources. Search results include documented methodologies, survey instruments, case studies, organizational models, and software applications. This diversity is intended to enforce problem solving in an integrated way to take advantage of synergistic effects. This prototype Workforce Toolkit, which has been enthusiastically received, serves as a proof of concept to show how enabling information technology can be to aiding state DOTs in responding to workforce challenges.

8.2 Recommendations

The success of this Toolkit relies on the ongoing commitment and support of a Workforce Toolkit steward. The AASHTO Subcommittee on Human Resources could take on responsibility for being the steward for the Toolkit with AASHTO hosting the application. At the time of completion of NCHRP Project 20-72, discussions were ongoing with NCHRP, the Federal Highway Administration and AASHTO regarding the actions needed to finalize the web-based application for public release and to support, launch and maintain the application. The audience and potential users for this tool include top agency executives, senior managers, human resources managers, line managers and workgroup supervisors and others within a Department of Transportation setting.



Abbreviations, Acronyms, Initialisms

AASHTO	American Association of State Highway and Transportation Officials
ASTD	American Society for Training and Development
BLS	Bureau of Labor Statistics
CCL	Center for Creative Leadership
CEG	Council for Excellence in Government
CEO	Chief Executive Officer
DOT	Department of Transportation
FAQ	Frequently Asked Questions
FHWA	Federal Highway Administration
GAO	U.S. General Accountability Office
GIS	Geographic Information System
GSA	U.S. General Services Administration
HR	Human Resources
HRI	Human Resources Institute
HRIS	Human Resources Information System
IPMA	International Personnel Management Association
ISPI	International Society for Performance Improvement
IT	Information Technology
NAPA	National Academy of Public Administration
NASPE	National Association of State Personnel Executives
NCHRP	National Cooperative Highway Research Program
OECD	Organization of Economic Cooperation and Development
OPM	U.S. Office of Personnel Management
ROI	Return on Investment
SHRM	Society for Human Resource Management
TCRP	Transit Cooperative Research Program
TRB	Transportation Research Board
USDOT	United States Department of Transportation



APPENDIX A

User's Guide to the Workforce Toolkit

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Introduction

Overview

The NCHRP Workforce Toolkit (<http://146.115.18.166/Workforce10a/NCHRP.aspx>) was developed to assist state Departments of Transportation (DOTs) and other transportation agencies with attracting and retaining staff who are equipped to successfully fulfill changing expectations for the DOT, while at the same time dealing with significant instability due to retirements, private sector competition, and an increasingly mobile workforce. A demonstration of the Toolkit is accessible on the Internet. This flexible and easy-to-use tool, the result of NCHRP Project 20-72, can help connect you to the information you need to address workforce challenges in the following areas:

- Characterizing and assessing core competencies of your agency's personnel, which are likely to be influenced by changing demographics, staff turnover, attrition, and competition from other employers.
- Characterizing and assessing the need to preserve institutional history and other mission-critical knowledge held by current personnel.
- Recruiting diverse staff to ensure needed competencies are in place to meet current and future demands.
- Educating, training, and developing staff to attain needed competencies, institutional history, and other mission-critical knowledge.
- Succession planning to ensure availability of highly competent and qualified personnel to fill current and future key management, leadership, and technical roles at all levels of the organization.
- Retaining staff to maintain productivity and continuity of operations.
- Ensuring an adequate and diverse supply of qualified entry-level personnel to meet current and future mission-critical requirements.

Content

The Workforce Toolkit currently contains resources that were selected from a review of literature and practice. These resources include books, articles, web sites, case studies, policies and procedures, measurement and assessment tools, methodologies, software applications, and consulting services that were culled from the transportation field, public sector, professional organizations and trade associations, academia, the military, the private sector, and labor unions. Materials chosen were determined to be the most useful in addressing DOT workforce challenges.

Design

Resources were entered into a SQL Server data base and identified by "facets" so they could be appropriately retrieved in response to queries. Facets are simply aspects or characteristics of the resources. Some views have been programmed to retrieve resources with a predetermined set of facets; other views allow you to select facets or words to conduct a search.

For more information on the design of the database, please see Chapter 2.

How the Searches Work

Resources in the database are tagged using different facets. These facets are divided into five types (audience, DOT role, item/resource type, source, and workforce category or need

type) and subcategorized within types. Each resource is tagged with a combination of facets that defines who is most likely to be interested in this information, who might find it most relevant to their job function, the kind of resource it is, and what subject it addresses. Additional facet types can be added by the site administrator. The currently defined facet types and subtypes are detailed below.

- Audience
 - General private sector
 - General public sector
 - Human resources
 - State DOT
 - Training and development
 - Transportation professionals
 - Other
 - Other Industry
- DOT role
 - Human Resources
 - Line managers/workgroup supervisors
 - Senior managers (division chiefs and district administrators)
 - Top agency executives (CEOs)
 - Other
- Item or resource type
 - Case
 - Consulting services
 - General resource
 - Measurement/assessment tool
 - Methodology/guide/model
 - Organization
 - Policy/procedure
 - Software application
 - Other
- Source
 - Journal/publisher
 - National Academy of Public Administration
 - National Association—human resources
 - National Association—public administration
 - National Association—transportation
 - State Department of Transportation
 - Transportation Research Board/National Highway Cooperative Research Program/Transit Cooperative Research Program
 - United States Department of Transportation
 - University research center
 - Other
 - Other state agency
- Workforce challenge or need type
 - Compensation and benefits
 - Competencies
 - Downsizing
 - Employee conflict
 - HR function

- HR information systems
- HR planning
- Knowledge management
- Leadership development
- Organizational change
- Organizational development
- Organizational performance
- Outsourcing/contract management
- Performance management
- Recruitment
- Reductions in Staff
- Retention
- Retirement
- Strategic planning
- Succession planning
- Training and development
- Workforce planning/development
- Other

Using the Web Site

This public-access site provides nine options for finding resources relating to issues impacting state DOT workforces. Five of the views access a database containing resources selected from web sites, books, publications, state DOT practices, and other educational resources selected for their usefulness and relevancy. These options accommodate different search styles for ease of use. Two options, Geographic View and State Practices, link to separate databases containing responses to surveys, statistical data or contact information. (Data needs to be added to the Geographic View.) Resource searches cannot be performed from these views. The three additional options available from each page in the toolkit return the user to the home page or connect to additional resources on the Internet.

Users can return to the previous screen by using their browser's back button or by using the Site Navigation trail at the top of the page (i.e., Home > Top Ten DOT Needs > Top Ten DOT Needs Resource List).

A "contact us" button is available at the top of each screen. Use this button to contact the developers (during the project) and the Web master (after the project is completed) of the Workforce Toolkit with questions not addressed in this user's guide.

Retrieving Information by View

All of the view options, including the option to return to the home page, are accessible from every page within the site with the exception of View 4, Faceted Search.

View 1—Top Ten DOT Workforce Needs

The screenshot shows the NCHRP Workforce Toolkit interface. The main content area is titled "Top Ten DOT Workforce Needs" and includes the sub-header "I am seeking resources to help me". Below this is a table with four columns representing different actions (A, B, C, D) and four rows representing different workforce needs. Each cell in the table contains a link to an "Overview" and a link to a "Resource list".

My organization needs to address	A. Understand issues and trends	B. Learn about peer agencies	C. Assess our situation	D. Implement programs, policies, procedures
1. Strategic workforce planning	Overview Resource list	Overview Resource list	Overview Resource list	Overview Resource list
2. Attracting and retaining talent	Overview Resource list	Overview Resource list	Overview Resource list	Overview Resource list
3. Retooling the workforce to meet evolving business needs	Overview Resource list	Overview Resource list	Overview Resource list	Overview Resource list
4. Grooming the next	Overview	Overview	Overview	Overview

This view accesses resources relevant to needs identified by the research team (in the future it will be the AASHTO Subcommittee on Human Resources) as priority issues facing DOT workforce managers. It allows users to uncover resources that will help them understand issues and trends, and to learn how peer agencies are addressing these issues to enable implementation of policies, programs and procedures to address the top ten workforce priorities. Each topic is explained in an overview, and available resources are retrieved by clicking the blue “resources” link.

The following top ten issues define the rows in the table:

- Strategic workforce planning,
- Attracting and retaining talent,
- Retooling the workforce to meet evolving business needs,
- Developing the next generation of leaders,
- Downsizing,
- Preserving institutional knowledge,
- Employee conflicts and performance issues,
- Outsourcing,
- Organizational change—reengineering and reorganizing, and
- Improving HR efficiency and effectiveness.

The view allows for further refinement of the search by connecting the column headers—Understand issues and trends; Learn about peer agencies; Assess our situation; and Implement policies, programs, procedures—with the 10 priority issues within the rows. Selecting “resource list” from the desired column and row retrieves relevant information from the database based on preprogrammed facets.

This search is preprogrammed to search by resource or item type; each cell within the table has a preselected item type attached. For example, resources relevant to a need to understand issues and trends (column A) and strategic workforce planning (row 1) searches the general resources

item type. If the organization needs to learn about strategic workforce planning (row 1) in peer organizations (column B), the toolkit searches the database for relevant cases.

An overview option within each cell provides a text summary of the search.

View 2—Frequently Asked Questions

NCHRP Workforce Toolkit Contact Us

Home > Frequently Asked Questions

FAQ

1. [What resources are available to help me with reductions in force?](#)
2. [A large percentage of our organization's workforce is due to retire over the next five years. How can we address this situation?](#)
3. [We are having a tough time filling open positions for engineers, and can't match consultant salaries. How can we find and attract good engineers?](#)
4. [There is a large gap in experience between our senior managers and engineers and the next tier of staff. How do we fill that gap before the senior folks all retire?](#)
5. [Our turnover rates are increasing, especially in our urban districts. How can we deal with this?](#)
6. [We have a key career manager planning to retire in two years. How can we make sure there is a smooth transition to a new person?](#)
7. [We are about to go through downsizing of our field units. How do we make this transition as smooth as possible?](#)
8. [We have several "problem" managers who need to build their supervisory skills. What resources are available for us to draw upon?](#)
9. [After many years of stability, we have undergone several reorganizations in the past two years. Morale is low and there is confusion about roles and responsibilities. How do we get on a better track?](#)
10. [Our mission has shifted and we are relying more on outsourced services. Our staff capabilities do not match our needs for good collaboration, oversight and negotiation skills. What is the most efficient way to address this mismatch?](#)

The Frequently Asked Questions (FAQ) view lists the 12 questions identified as addressing priority issues for state DOTs, including inquiries regarding reductions in force, retirement, recruitment, turnover, downsizing, reorganizing, performance metrics, strategic planning, outsourcing and data management resources. Clicking on a question retrieves an alphabetical list of relevant resources by title and a short description of each resource. Clicking on the work's title leads to additional information, including a link to the source document and contact information (if available).

The FAQ view is preprogrammed to retrieve information from the database that includes relevant workforce or need type and item or resource type. For example, resources for question 2, “A large percentage of our organization’s workforce is due to retire over the next five years. How can we address this situation?” are gathered from resources that address recruitment, succession planning, leadership development, retirement, and knowledge management.

View 3—Functional View of Workforce Needs

NCHRP Workforce Toolkit [Contact Us](#)

[Home](#) > [Functional View](#)

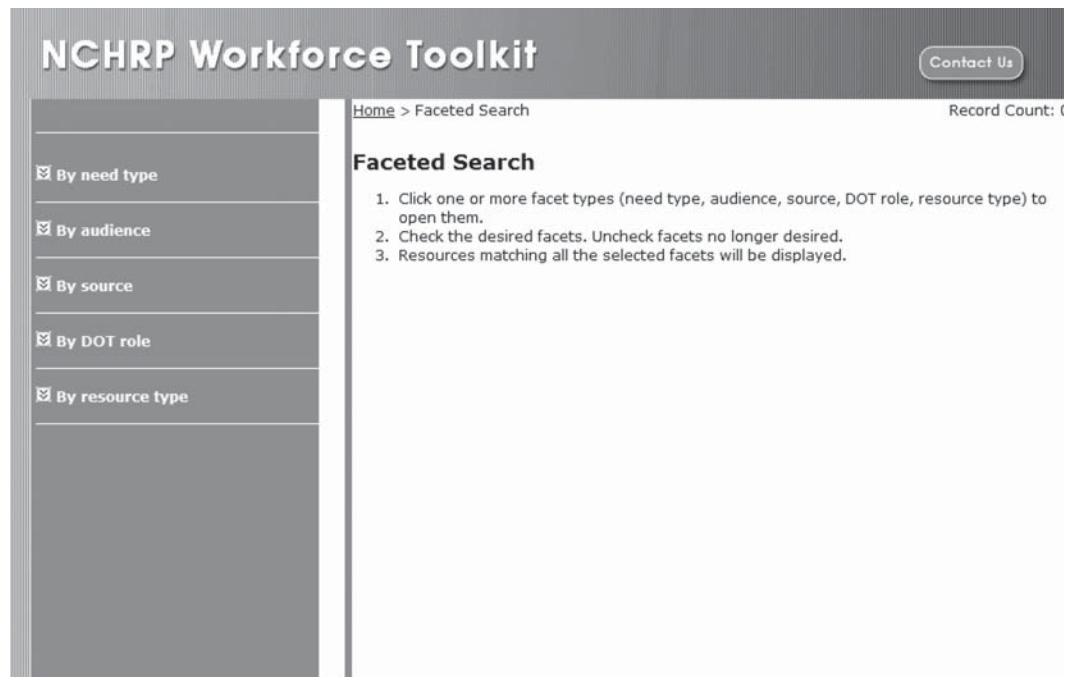
Functional View of Workforce Needs

1. [Strategic Workforce Planning Definition](#) [resources](#)
 1. [Human Capital Planning](#) [resources](#)
 2. [Workforce Planning](#) [resources](#)
 1. [Succession Planning](#) [resources](#)
2. [Operational Human Resources](#) [resources](#)
 1. [Organizing Work](#) [resources](#)
 1. [Tasks and Priorities](#) [resources](#)
 2. [Career Ladders and Paths](#) [resources](#)
 3. [Position Prioritization](#) [resources](#)
 2. [Recruiting and Retaining Talent](#) [resources](#)
 1. [Needs Identification](#) [resources](#)
 2. [Competencies and Education](#) [resources](#)
 3. [Recruitment Planning and Process](#) [resources](#)
3. [Compensating and Rewarding Employees](#) [resources](#)
 1. [Compensation Philosophies](#) [resources](#)
 2. [Compensation Systems](#) [resources](#)
 3. [Reward Programs](#) [resources](#)
 4. [Benefits Administration](#) [resources](#)
 5. [Benefits Planning](#) [resources](#)
 6. [Workmen's Compensation](#) [resources](#)
4. [Managing Employee Performance](#) [resources](#)
 1. [Performance Appraisal](#) [resources](#)
 2. [Performance Metrics](#) [resources](#)
 3. [Career Development](#) [resources](#)
 4. [Mentoring](#) [resources](#)
 5. [Coaching](#) [resources](#)
 6. [Employee and Labor Relations](#) [resources](#)

This view searches the database based on specific workforce needs and functions of the Human Resources department (strategic workforce planning, organizational human resources, compensating and rewarding employees, managing employee performance, and human resources services). Selecting any of these topics displays a text summary of the function. Selecting the resources option retrieves an alphabetical list of resource titles and a short description of each title. Clicking on the title brings the user to more detailed information, including the URL and contact information (if available).

Resources for the more general functions include multiple workforce challenges or need types. Retrieved information for function 1, for example (Strategic Workforce Planning), is culled from resources containing information on workforce planning/development, succession planning, and knowledge management. The more specific issues under the general functions narrow the search by need type to eliminate irrelevant topics. Workforce planning (issue 1.2) searches only resources tagged as containing workforce planning/development material or succession planning information. Some functions are further refined (i.e., function 1.2.1, succession planning), which correlates to a further refining of the search. In this example, resources retrieved are only tagged succession planning.

View 4—Faceted Search



View 4 allows the user to define the search specifics instead of relying on the facets that have been preprogrammed into Views 1–3. Five facets are available from the menu: need type, audience, source, DOT role, and resource type. Each option contains a drop-down menu that allows the user to further specify search specifics. These specifics correspond to those listed in the “How Searches Work” section above.

There is no restriction on the number of facets that can be selected in this view. Any combination of boxes can be checked, which allows for highly customized searches.

In this prototype of the Toolkit, users must unselect facets from a prior search before conducting a new search in any given session. Simply hitting the browser’s back button does not clear the search. *NOTE:* This issue will be addressed in future versions of the Toolkit.

View 5—Geographic View

NCHRP Workforce Toolkit

Contact Us

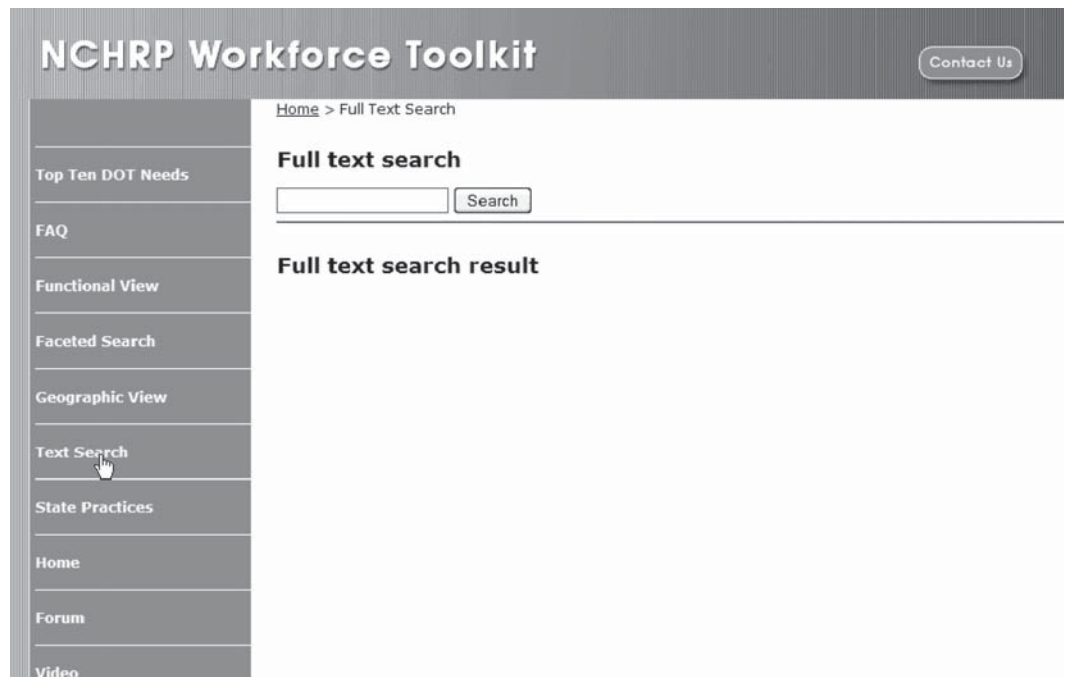
Home > Geographic View

Click on a State to View Info :

- Knowledge Management
- HR Information Systems
- Contacts/Web Pages
- Number of Employees
- Time HR Outsourced
- Labor Unions

The Geographic View provides a visual representation of the United States and allows users to find information by state. This view is linked to tables that will contain information from state DOTs regarding knowledge systems and human resources information systems, contact information, links to state DOT web sites, statistics on number of state DOT employees, and information on which states outsource human resources functions and which have labor unions. Much of this data is not yet available. Source documents are not available from this view.

View 6—Full Text Search

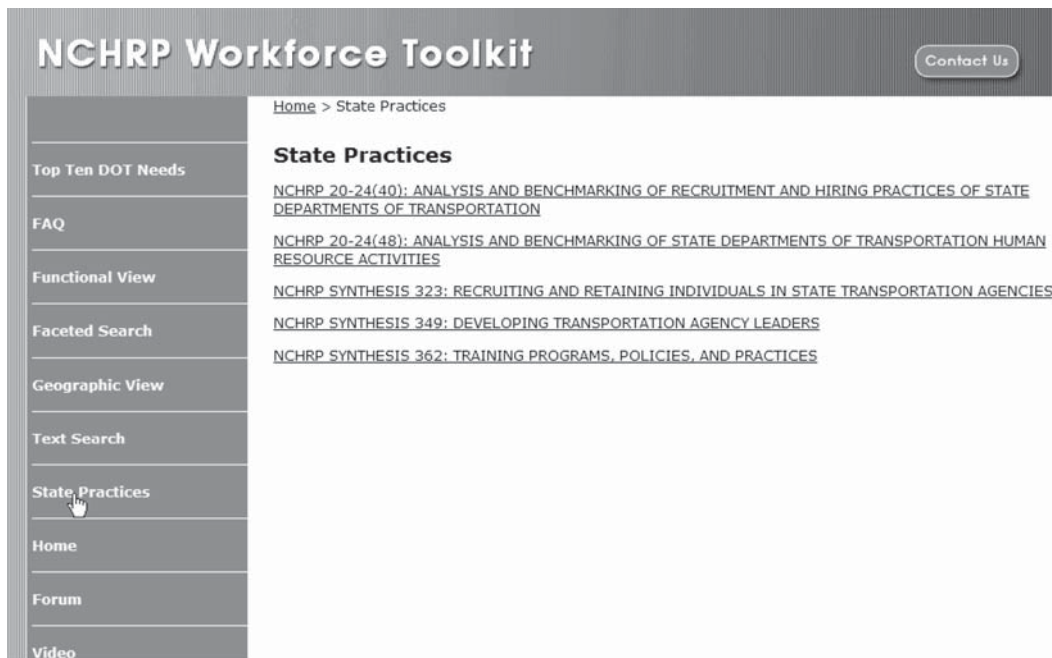


Full Text Search allows users to search by keyword(s) of their own choosing. Using words entered in the textbox, the site searches titles, short descriptions, and long descriptions to locate relevant sources. Any number of keywords can be entered into the text box; selecting “enter” will retrieve search results alphabetized by title and including a short description. Search results can be resorted by the first word of descriptions by clicking on the column heading.

Selecting the work’s title opens a screen containing descriptions, source author, organization, contact information, web site links and other relevant information.

NOTE: To conduct a new search, users must delete prior word(s) and enter new ones. The text box does not automatically reset after a search.

View 7—State Practices



The State Practices view provides access to 63 web pages that display state level data derived from the State Practices Excel spreadsheet. The view summarizes, by state, findings from NCHRP studies on recruitment, retention, succession planning, training, and change management. Currently, this view contains information on:

- NCHRP Project 20-24(40), “Analysis and Benchmarking of Recruitment and Hiring Practices of State Departments of Transportation.”
- NCHRP Project 20-24(48), “Analysis and Benchmarking of State Departments of Transportation Human Resource Activities.”
- *NCHRP Synthesis 323: Recruiting and Retaining Individuals in State Transportation Agencies.*
- *NCHRP Synthesis 349: Developing Transportation Agency Leaders.*
- *NCHRP Synthesis 362: Training Programs, Policies, and Practices.*

Tables of Survey Data Accessed by State Practices View

Competencies

- HR Competencies
- Education Level of Professionals (%)
- HR Core Competencies

HR Function

- Crisis Management
- Human Resources
- Rate the Importance of the Following HR Functions to your DOT
- Crisis Management

HR Information Systems

- HR Software
- Means to Share and Integrate Information
- What Communication Tools Do You Use?

HR Planning

- Professionals by Classification (%)
- Professionals by Classification (2002)

Knowledge Management

- Knowledge Management

Leadership/Development

- Agency Leaders
- Developing Transportation Agency Leaders
- Education Level of Professionals (%)

Outsourcing/Contract Management

- For Any of the Following HR Functions Outsourced in Your DOT, Please Select How Many Years They Have Been Outsourced
- HR Outsource
- HR Outsource Considered
- If HR Functions are Outsourced, Rate Your Satisfaction
- Which Department Manages the Outsourced HR Service? How Satisfied Are You With Their Management?
- HR Outsourcing

Performance Management

- Effective Employees Get Higher Pay Raises (%)
- Effective Employees Get Promoted (%)

Recruitment

- Impact of Recruiting Strategies
- Effectiveness of Recruiting
- Measuring the Effectiveness of Recruiting Entry Level Employees
- Measuring the Effectiveness of Recruiting Mid-Career Level Employees
- Most Successful Practices for Recruiting Employees
- Relevant Issues Regarding the Demographics of the Agency
- Significant Recruitment Factors (%)
- Strategies for Recruiting Engineers, Technicians, IT, Other Professionals

Retention

- Employee Turnover Rates (by Year)
- Factors Influencing Retention (%)
- Factors Influencing the Decision to Leave State Service (%)
- I am Proud to be a State Employee (%)
- I Make a Positive Contribution to My Agency (Ranking 1-10) (%)
- I Make a Positive Contribution to My Community (Ranking 1-10) (%)
- Impact of Retention Strategies
- Likelihood of Leaving for Private Sector (%)
- Morale is High in My Agency (%)
- Morale is Higher in My Agency than it was 5 Years Ago (%)
- My Work is Valued by my Agency, Customers, Supervisors (%)
- Retention Impacts
- Who Influences Employees to Stay (%)?

Retirement

- Likelihood of Retiring from State Service (%)
- Years to Retirement

Succession Planning

- Succession Plan

Training and Development

- Funding Sources and Methods
- Opportunities, Challenges, Constraints
- Partnerships with Other Agencies, Private Sector Organizations, Non-Profit Entities, Public Sector Agencies, Universities
- Professional Certification, Registration, Continuing Education and Certification Programs
- Structure for Accomplishing Training and Development
- Training
- Training Delivery Mechanism
- Training Evaluation Methods
- Training Needs Assessment

Workforce Planning/Development

- Critical Skills Identification
- Strategic Plan

Other

- # of DOT Employees by Division (2002)
- Average Hours Worked per Week (%)
- Employees Taking Work Home
- Frequency of Taking Work Home (%)
- Professionals by Age (%)
- Professionals by Gender (%)
- Years in Current Position
- Years in State Employment

Additional Functions

Home

Home returns users to the home page of the Workforce Toolkit web site.

Forum

The Forum option connects users to the Federal Highway Administration's Knowledge Sharing web site. From this site, users can access Communities of Practice, which are virtual home bases providing members with access to information, discussion, and collaboration on specific subject areas of interest to the highway community. The link to the Communities of Practice is included to illustrate the concept of user forums. The Toolkit steward may choose to use another social networking mechanism for user exchange.

Users can also access FHWA online presentations called "Knowledge On-Demand." These multimedia presentations are self-contained packages that combine textual, audio, and video elements to create the learning experience of attending a presentation.

Video

Selecting the "Video" option connects users to a YouTube site containing videos from the American Association of State Highway and Transportation Officials (AASHTO).



APPENDIX B

User's Guide to the Workforce Toolkit Administration Site

CONTENTS

B-2 Introduction

B-2 Edit Resources

- B-3 Add
- B-3 Edit
- B-4 Delete

B-4 Edit Resource Facets

- B-6 Add
- B-6 Delete

Introduction

This User Guide is intended for the administrator of the Workforce Toolkit. In this version of the Workforce Toolkit, all of the data management, including data entry, editing, and deletion, can only be done by the administrator. The URL for the demonstration site is: <http://146.115.18.166/Workforce10Admin/login.aspx?ReturnUrl=%2fWorkforce10Admin%2fResourceEdit.aspx>.

The workforce toolkit administration site provides the ability to add, delete, and edit resources and their facets. It requires login with username and password to make any changes to resources. If a user is not logged in, there is no access to any page of the Web site. The login credential is saved in a cookie that expires in 30 minutes, when the user must log in again.

After logging in, the administrator can navigate to the Edit Resources or Edit Resource Facet pages. There is also a logout page and a home page with a small amount of descriptive text.

Edit Resources

Home > Edit Resources

Edit Resources

[Add New Resource](#)

ResourceID	Title
Select 1	Effective Administrative Restructuring: Lessons from the NIH Experience
Select 2	NASA: Balancing a Multisector Workforce to Achieve a Healthy Organization
Select 3	Human Capital Flexibilities for the 21st Century
Select 4	Human Capital: Selected Agencies' Experiences and Lessons Learned in Designing Training and Development Programs
Select 5	Four Leadership Principles to help Transportation Professionals
Select 6	Human Capital: Designing and Managing Market-Based and More Performance-Oriented Pay Systems
Select 8	A Competency Model for Human Resources Professionals
Select 9	A Guide for Effective Strategic Management of Human Resources
Select 10	Managing Change in State Departments of Transportation: Innovations in Workforce Strategies (Scan 5 of 8)
Select 11	Analysis and Benchmarking of State DOT Human Resource Activities

1 2 3 4 5 6 7 8 9 10 ...

Click 'Add New Resource' to add a resource. Select a resource to edit or delete it

The Edit Resources page allows the administrator to add, delete, or edit resources in the database.

Resources can be sorted by Resource ID number or by title by clicking on the desired column heading. Clicking “select” on the row containing the desired resource displays a box with Resource ID, Resource title, and the option to edit or delete.

Add

Edit Resources

[Add New Resource](#)

ResourceID	Title
Select 1	Effective Administrative Restructuring: Lessons from the NIH Experience
Select 2	NASA: Balancing a Multisector Workforce to Achieve a Healthy Organization
Select 3	Human Capital Flexibilities for the 21st Century
Select 4	Human Capital: Selected Agencies' Experiences and Lessons Learned in Designing Training and Development Programs
Select 5	Four Leadership Principles to help Transportation Professionals
Select 6	Human Capital: Designing and Managing Market-Based and More Performance-Oriented Pay Systems
Select 8	A Competency Model for Human Resources Professionals
Select 9	A Guide for Effective Strategic Management of Human Resources
Select 10	Managing Change in State Departments of Transportation: Innovations in Workforce Strategies (Scan 5 of 8)
Select 11	Analysis and Benchmarking of State DOT Human Resource Activities

1 2 3 4 5 6 7 8 9 10 ...

ResourceID:

Title:

ShortDescription:

Selecting “add new resource,” located above the table, opens a screen with fields for the resource ID, resource title, short description, long description, author, reference, organization, contact information, web site, resource cost and format, resource application, and other resource users (if known). Resource ID numbers must be manually entered; the system will not allow resources with duplicate ID numbers. To determine the next sequential resource ID number, the user must navigate to the last page of the existing resources list. Once the new resource information is entered, the user can add the resource to the database by clicking on “accept” or discard the entry by selecting “cancel.”

Edit

NCHRP Workforce Toolkit [Contact Us](#)

Home > Edit Resources

Edit Resources

[Add New Resource](#)

ResourceID	Title
Select 1	Effective Administrative Restructuring: Lessons from the NIH Experience
Select 2	NASA: Balancing a Multisector Workforce to Achieve a Healthy Organization
Select 3	Human Capital Flexibilities for the 21st Century
Select 4	Human Capital: Selected Agencies' Experiences and Lessons Learned in Designing Training and Development Programs
Select 5	Four Leadership Principles to help Transportation Professionals
Select 6	Human Capital: Designing and Managing Market-Based and More Performance-Oriented Pay Systems
Select 8	A Competency Model for Human Resources Professionals
Select 9	A Guide for Effective Strategic Management of Human Resources
Select 10	Managing Change in State Departments of Transportation: Innovations in Workforce Strategies (Scan 5 of 8)
Select 11	Analysis and Benchmarking of State DOT Human Resource Activities

1 2 3 4 5 6 7 8 9 10 ...

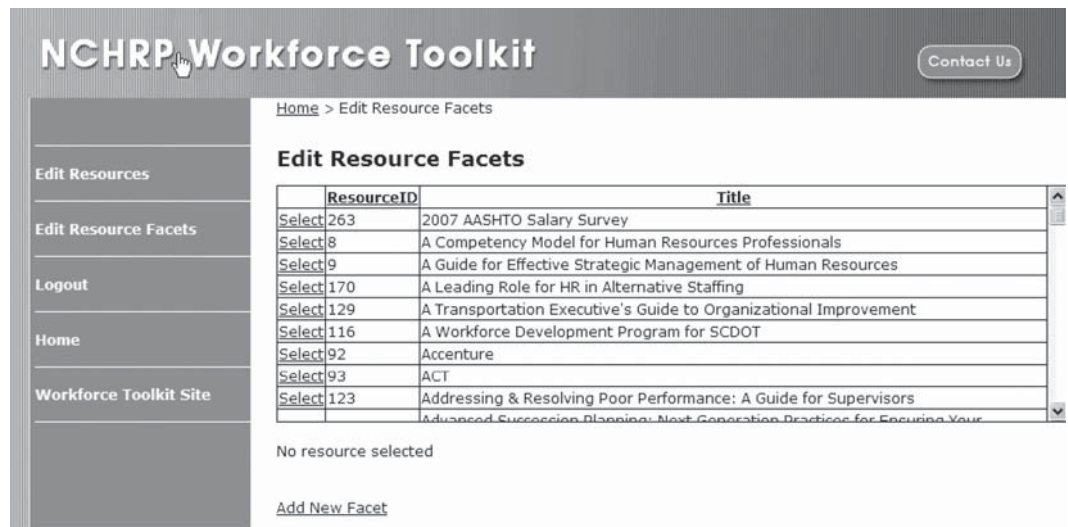
Click 'Add New Resource' to add a resource. Select a resource to edit or delete it

The edit option opens a screen displaying the resource’s ID, title, short description, long description, author, and other relevant information including reference, organization, contact information, web site, resource cost and format, resource application, and other resource users (if known). Once the desired change has been made, the user selects “update” to accept the changes or “cancel” to discard them.

Delete

The delete option removes the resource from the database.

Edit Resource Facets



The Edit Resource Facet page allows the user to add or delete facets associated with a document. Facets are aspects or characteristics of the resources and are used to identify the relevancy of sources to searches. Workforce Toolkit facets are grouped by type: Audience, DOT Role, Resource Type, Source, and Need/Workforce Challenge.

These types are further defined by 56 facet values. Currently, the database recognizes 8 different audience types, 5 DOT roles, 9 item or resource types, 11 source types, and 22 workforce challenge or need types.

Additional facet types can be added by the site administrator. The following are currently defined facet types and subtypes:

- Audience
 - General private sector
 - General public sector
 - Human resources
 - State DOT
 - Training and development
 - Transportation professionals
 - Other
 - Other Industry
- DOT role
 - Human Resources
 - Line managers/workgroup supervisors
 - Senior managers (division chiefs and district administrators)

- Top agency executives (CEOs)
- Other
- Item or resource type
 - Case
 - Consulting services
 - General resource
 - Measurement/assessment tool
 - Methodology/guide/model
 - Organization
 - Policy/procedure
 - Software application
 - Other
- Source
 - Journal/publisher
 - National Academy of Public Administration
 - National Association—human resources
 - National Association—public administration
 - National Association—transportation
 - State Department of Transportation
 - Transportation Research Board/National Highway Cooperative Research Program/Transit Cooperative Research Program
 - United States Department of Transportation
 - University research center
 - Other
 - Other state agency
- Workforce challenge or need type
 - Compensation and benefits
 - Competencies
 - Downsizing
 - Employee conflict
 - Human Resources function
 - Human Resources information systems
 - Human Resources planning
 - Knowledge management
 - Leadership development
 - Organizational change
 - Organizational development
 - Organizational performance
 - Outsourcing/contract management
 - Performance management
 - Recruitment
 - Reductions in Staff
 - Retention
 - Retirement
 - Strategic planning
 - Succession planning
 - Training and development
 - Workforce planning/development
 - Other

Resources can be sorted by Resource ID or by title by clicking on the desired column heading. Clicking “select” on the row containing the desired resource displays the selected Resource ID and title below the table and a second table with the existing facets for the resource.

Add

Home

Workforce Toolkit Site

Select	116	A Workforce Development Program for SCDOT
Select	92	Accenture
Select	93	ACT
Select	123	Addressing & Resolving Poor Performance: A Guide for Supervisors
		Advanced Succession Planning: Next Generation Practices for Ensuring Your

Resource 9 A Guide for Effective Strategic Management of Human Resources selected

Add New Facet

	ResourceID	Facet	
Delete	9	Audience - General Public Sector	▼
Delete	9	Audience - Human Resources	▼
Delete	9	DOTRole - Top agency executives (CEOs)	▼
Delete	9	DOTRole - Human Resource	▼
Delete	9	ItemType - General Resource	▼
Delete	9	ItemType - Methodology/Guide/Model	▼
Delete	9	ItemType - Measurement/Assessment Tool	▼
Delete	9	ItemType - Case	▼
Delete	9	ItemType - Policy/Procedure	▼
Delete	9	Source - NAPA	▼
Delete	9	WorkforceCategory - HR Planning	▼

Resource ID:

Facet:

[Insert](#) [Cancel](#)

Selecting a resource displays the existing facets associated with that resource. Using the drop-down facet menu, the user can select the facet to be added. “Insert” adds the facet; “cancel” discards the new facet and returns the user to the prior screen.

Delete

To delete a facet, select “delete” in that facet’s row.

Abbreviations and acronyms used without definitions in TRB publications:

AAAE	American Association of Airport Executives
AASHO	American Association of State Highway Officials
AASHTO	American Association of State Highway and Transportation Officials
ACI-NA	Airports Council International-North America
ACRP	Airport Cooperative Research Program
ADA	Americans with Disabilities Act
APTA	American Public Transportation Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATA	Air Transport Association
ATA	American Trucking Associations
CTAA	Community Transportation Association of America
CTBSSP	Commercial Truck and Bus Safety Synthesis Program
DHS	Department of Homeland Security
DOE	Department of Energy
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
IEEE	Institute of Electrical and Electronics Engineers
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
ITE	Institute of Transportation Engineers
NASA	National Aeronautics and Space Administration
NASAO	National Association of State Aviation Officials
NCFRP	National Cooperative Freight Research Program
NCHRP	National Cooperative Highway Research Program
NHTSA	National Highway Traffic Safety Administration
NTSB	National Transportation Safety Board
SAE	Society of Automotive Engineers
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (2005)
TCRP	Transit Cooperative Research Program
TEA-21	Transportation Equity Act for the 21st Century (1998)
TRB	Transportation Research Board
TSA	Transportation Security Administration
U.S.DOT	United States Department of Transportation