

RESPONDING TO THE CHANGING COMPETENCY REQUIREMENTS OF THE STATE DOT EMPLOYEE

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ABSTRACT

The DOT employee of today needs to have a much larger skill set than the DOT employee of 20 years ago. More work needs to be done by an ever shrinking pool of qualified applicants.

How do we increase the number of qualified applicants? How do we recruit the applicants with the skills sets we need at the DOT? How do keep these well-qualified applicants employed at the DOT?

US State DOTs use a variety of methods to recruit, train and retain the well-qualified applicants. Student outreach programs for K thru 12 students. Internships for high school and college students. Scholarships for college students majoring in transportation related areas. These are some of the steps being taken by US State DOTs in an effort to develop, recruit, train and retain employees with the skills necessary to the DOT.

This paper and presentation will present examples or programs that US State DOTs are using to attract and keep employees with the skills needed to operate a DOT in the 21st century.

A strong transportation system is vital for the United States or any other country to survive and prosper in the 21st century.

A Department of Transportation (DOT) needs qualified, competent people to plan, design, build and maintain the 21st century transportation system. Where do DOTs find such people? How do they recruit them, train them and keep them? These are the challenges being faced by DOTs in the United States. A generational turnover is about to occur in the DOT workforce and the pool of individuals with the skills needed to replace this workforce has been steadily getting smaller. How will DOTs solve this problem?

The solution to the workforce problem of the US DOTs is being addressed in 3 ways. Student Outreach, Recruiting and Training and Retention Programs

1. Student Outreach. Most state DOTs are reaching out into the community. They are making themselves more visible to students. DOTs are using careers days and job shadow days as vehicles to get transportation engineering careers to the student's attention. Some DOT's are working with K thru 12 schools to have a permanent presence in the classroom. Speakers Bureaus and Mentoring programs such as AASHTO's TRAC Program provide opportunities for DOT professionals to go to the classroom and work directly with students. By planting the seeds early and often, DOTs will give students a greater knowledge of transportation careers.
2. Recruiting. Occurring at the University, Community College and High School. Competition for new employees is fierce. In order for DOTs to get the new graduates, they must recruit on the high school and college campuses.
3. Training and retention. Hiring is just the beginning. Training is key to staying competitive. Keeping the workforce up to date in the latest methods of their job will go along way to keeping them at the DOT.

This paper will give examples of DOT programs designed to recruit new employees and train and retain those employees.

STUDENT OUTREACH

It is more likely for a student in grade school or high school to become interested in a career if they know an adult who is in that career. In other words, if DOTs want students to become interested in careers at the DOT, students need to meet and get to know DOT employees. The introduction of DOT employees to the classroom is done in many ways. The most popular DOT/classroom experiences are Career Days, Job Shadow Days and Classroom Mentoring and Student Outreach.

Career Days involve DOT Employees making a presentation about their job and other careers at the DOT to students. This presentation is usually followed by a hands on activity conducted with the students. Career days take place in the classroom or at a DOT facility.

Job Shadow Days bring a small number of students into the DOT Office. Students are assigned to a DOT employee and the student spends the day observing the DOT employee as they go about their job duties. As an enhancement, students are often given

tasks to perform while shadowing. Students shadow in a work area of the DOT that they are interested learning more about.

Mentoring and Student outreach usually involves establishing a permanent relationship with the education community. DOT employees, acting as mentors, adopt a school and visit the classroom on a regular basis. The DOT mentor gives presentations and conducts activities along side the teacher. Some states have developed their own outreach programs. 22 states use AASHTO's Transportation and Civil Engineering Program (TRAC) outreach program.

The following are examples of student outreach programs used at DOTs in the US.

Arizona Department of Transportation (ADOT)

The DOT participates in Career Days at the various high schools to explain potential future careers at ADOT. This is a program that ADOT is considering expanding to include hands-on workshops at various high schools.

Idaho Department of Transportation IDOT

IDOT conducts pipeline educational outreach; however, it is done on a district-by-district basis. Some districts go to elementary schools; others bring students to IDOT locations to see the equipment and to hear about various transportation career opportunities

New Hampshire Department of Transportation (NHDOT)

Uses AASHTO's TRAC program to develop and maintain interest in the Civil Engineering field at the high school level.

Washington State Department of Transportation (WSDOT)

The WSDOT is establishing a pilot mentoring program where engineers from the DOT, local transportation jurisdictions and the American Council of Engineering Companies – Washington (ACEC-WA) would team-teach in math & science classes as “guest lecturers” at the elementary school, middle school and high schools of various public school districts. Promote interest in Civil Engineering and other engineering disciplines through team teaching math & science courses in each school. WSDOT will evaluate the pilot and expand to other school districts, if successful.

Nebraska Department of Roads (NDOR)

The NDOR has job shadow programs for students in elementary, junior and senior high schools. They also conduct special classes for schools and organizations setting up surveying classes, Microstation or CADD drafting classes, slide shows of engineering projects, career days, etc. to show students what it is that NDOR does.

Nevada Department of Transportation (NDOT)

The NDOT has implemented several outreach programs geared towards students in grades K-16.

Most notably is the TRAC program which focuses on grades 4th through 12th. We are also involved in Career fairs, Science and Technology fairs, and Engineering Summer Camps at the K-12 level.

At the Community College and University level, NDOT offers 45 summer internships to undergraduate and graduate students in preparation for careers in civil engineering, planning, right of way, computer science, land surveying, and landscape architecture.

North Dakota Department of Transportation (NDDOT)

The NDDOTt uses AASHTO's TRAC Program for student out reach. The department has established relationships with 14 middle and high schools in the state. The department provides funding for the modules, teacher training, and travel expenses. A retired engineer has come on board on a half time basis to oversee the relationships and to provide hands on experience in the classroom. We are currently exploring opportunities to link our TRAC students with our scholarship and internship programs.

Mississippi Department of Transportation (MDOT)

Students throughout Mississippi have a greater understanding and appreciation of the transportation industry and are enhancing their applied math and science skills through the Mississippi Department of Transportation's (MDOT's) implementation of transportation education for students from kindergarten through high school.

MDOT introduced AASHTO's TRAC (Transportation and Civil Engineering) program to Mississippi schools in 1997. The program was well received in high schools and middle schools, but generated particular enthusiasm at the middle school level. That prompted MDOT to focus the next round of program expansion on seventh- and eighth-grade students.

TRAC was aligned with the state framework for Career and Computer Discovery, which is taught to every seventh grade student in Mississippi. By 2005, the Mississippi Department of Education had adopted TRAC into the statewide Career and Computer Discovery curriculum. MDOT has trained 252 teachers to date with TRAC being in 184 schools statewide.

MDOT developed its own hands-on transportation education program geared toward students in kindergarten through sixth grade, working with curriculum writers at the University of Mississippi. The program, known as RIDES (Roadways In Developing Elementary Students), was introduced to nine elementary schools during Summer 2004 by university professors who had helped develop the program. In 2005, certified elementary and middle school teachers became the primary trainers. During that summer, 149 teachers from across the state attended the two-day training. Overall, MDOT has trained 453 teachers with RIDES being in 185 schools statewide.

MDOT is expanding transportation education to yet another level through its partnership with the Redesigning Education for the 21st Century Workforce in Mississippi Initiative, spearheaded by the Mississippi Superintendent of Education. During Summer 2007, selected math and science teachers from 15 pilot school districts in Mississippi will work with MDOT engineers in the field. They will develop Engineering and Transportation units for a new ninth grade curriculum that will be piloted during the 2007-2008 school year. The hands-on curriculum will be accompanied by a video of MDOT engineers on the job.

RECRUITING AT THE HIGH SCHOOL, COMMUNITY COLLEGE AND UNIVERSITY

Transportation is not the only industry facing future workforce shortages. Skilled and educated individuals are in demand. Recruiting at High Schools and Colleges is critical if Departments of Transportation are to have a strong workforce.

The following are examples of recruiting methods used by DOTs.

Arizona Department of Transportation (ADOT)

The Summer Engineering Program (SEP) employed 46 students last year and have requests for 51 this year. The program gives Civil Engineering students the opportunity to gain practical experience in the engineering field during the summer as interns with ADOT. The students are assigned to a variety of highway construction projects, or to special studies within the Division. The type of work depends on the needs of the Department and may vary according to the Groups and Districts to which they are assigned. This is a statewide program, with the majority of interns assigned within the major metropolitan areas. One of the goals of the program is to encourage the students to apply for the EIT (Engineer in Training) program upon graduation, and continuing with the Department in engineering positions when they receive their P.E. in Civil Engineering.

Equipment Services - Student Aides - Junior & Senior Year High School Students work in Equipment Services Shops (vehicles, light duty & heavy-duty equipment repair & maintenance) across the state to gain work experience. The school counselor usually selects the student whose interest would be applicable to the shop environment. They work summers and school vacations. The Human Resources Office administers this program.

Interns - The Walter Cronkite School of Journalism and Mass Communication at ASU provides three (3) interns per semester. The intern coordinator at ASU screens the applicants to identify people who are leaning towards print journalism.

Other future initiatives are developing partnerships with the Maricopa Skill Center or other alternative schools to hire individuals who have obtained a certification (maintenance, construction, and mechanics). During the recruitment process, career ladders are part of the discussion.

Idaho Department of Transportation (IDOT)

The DOT plans to partner with community colleges and other community entities to recruit new employees.

New Hampshire Department of Transportation (NHDOT)

The DOT partnered a recruiter, a Driver Qualifications Specialist and Highway Patrol Foremen to visit the technical high school programs to attract applicants to Highway Maintainer Positions. NHDOT had a reasonable degree of success with this endeavor. NHDOT hires Highway Maintainers without a Commercial Driver's License and allows one year to obtain that license.

During the one-year period the NHDOT provides training and the use of NHDOT trucks to take the test. Once the license is obtained, the NHDOT classification system allows for a promotion to Highway Maintainer II. This is a good career opportunity for students who may not have interest in attending college or who might not have financial means to attend college.

Washington State Department of Transportation (WSDOT)

Plans to expand the presence of recruiting for the Transportation Technician 1 (TT1) positions to high schools, and technical and community colleges, targeting high school graduates in underutilized groups and non-traditional applicants. Upon completion of an in-

house training program or certified Apprenticeship Program, and successfully passing a qualifying exam, a TT1 would automatically promote to a TT2 position.

The WSDOT Apprenticeship Program will focus on attracting high school and GED graduates, as well as non-traditional workers (federally protected classes), with an interest in entering a pre-engineering job class. Historically, statistics have shown low numbers of non-traditional workers entering engineering and pre-engineering fields. This is true of the WSDOT workforce as well.

Consequently, the WSDOT interest lies primarily with those who for whatever reason, have chosen to enter the workforce directly after high school graduation or completion of a GED. By targeting this type of individual, the Department's number of non-traditional workers entering engineering and pre-engineering fields should increase through the use of this program. WSOT's program will offer technical skills training, a livable wage, and the potential for career advancement whether participants later decide to obtain a degree or not.

Nebraska Department of Roads (NDOR)

The NDOR has student programs that are instrumental in getting young people involved in the transportation business. NDOR has formed partnerships with universities and colleges to advertise Work Study opportunities for students to earn money while they apply what they are learning in school in engineering and technical classes. NDOR has internships to help students complete requirements for graduation and CO-OPS where students are able to work a semester in lieu of classroom instruction applying their knowledge and skills in a job that interests them.

Nevada Department of Transportation (NDOT)

At the Community College and University level, NDOT offers 45 summer internships to undergraduate and graduate students in preparation for careers in civil engineering, planning, right of way, computer science, land surveying, and landscape architecture.

North Dakota Department of Transportation (NDDOT)

NDDOT offers recruitment bonuses of up to 2.5 months pay, paid in 2 sums, one at start and the 2nd after one year of employment. This has allowed NDDOT's initial pay offer to be reasonably competitive.

NDDOT established a design center on the campus at North Dakota State University to provide work experience while in college and to provide encouragement for full time employment upon graduation. This program has resulted in the hire of several well-trained employees. Advancement has been rapid for the employees coming from this background.

Scholarships are provided to a number of engineering or technical school students in order to incent their eventual employment with the department.

NDDOT has a very active internship program designed to provide college students with onsite work experience which has been designed to provide extensive learning and development opportunities and to meet requirements of their college or university for internship credit.

Virginia Department of Transportation (VDOT)

The VDOT Transportation Engineer Scholarship Program provides a \$3500 scholarship per semester to selected students at least in their sophomore year and majoring in civil engineering. VDOT has 30 scholarships. Students selected work for VDOT during breaks and during the summer to learn the business. When a student graduates, he/she enters the agency's engineer development program (24 months).

TRAINING AND RETENTION OF DOT EMPLOYEES.

Its workforce must be continually trained if a DOT is to operate efficiently in the 21st century. Given opportunities outside of the DOT, helping employees get and maintain professional certifications is vital to keeping your workforce at the DOT.

Keeping employees trained will help keep them at the DOT and keep them productive. While salaries can be a motivating factor in employment retention, job satisfaction is just as important. Keeping employees trained in the latest methods will go a long way to keeping them at the DOT.

Even the most dedicated employee will eventually leave the DOT. When an employ leaves, so does their knowledge and experience. Senior managers and senior technical staff have years of institutional knowledge and experience that will go with them when they leave State DOT service. A plan must be in place to capture and pass on this knowledge and experience to the next generation of DOT Employee.

Here are examples of training and retention programs used at DOTs in the US

New Hampshire Department of Transportation (NHDOT)

The NHDOT offers 50% tuition reimbursement to employees and funds other training that would support a career path at DOT.

West Virginia Department of Highways (WVDOHW)

The West Virginia Department of Highways and Fairmont State University have collaborated to form the Transpiration Engineering Technical Program. This program certifies technicians at 5 different levels. This program allows individuals to obtain an A.A.S. Degree on-line in ten years.

LEVEL I—TET Transportation Engineering Technician Trainee

0 yrs experience — Pass WVDOP Examination

LEVEL II—TETA Transportation Engineering Technician Associate

2 yrs experience and 180 Training Hours

LEVEL III—TET Transportation Engineering Technician

5 yrs experience and 450 Training Hours

LEVEL IV—TET-SC or TET-SE Transportation Engineering Technician-Senior 10 yrs experience and 900 Training Hours

LEVEL V—Technologist C or E Transportation Engineering Technologist 12 yrs experience and 990 Training Hours

Washington Department of Transportation (WSDOT)

Focus on cross training at all Transportation Technician and Transportation Engineer levels to develop a well-rounded, well-trained work force that promotes a diverse knowledge base with multiple skill sets. Cross training employees result in a workforce that is able to quickly adjust to the changing needs of the industry.

WSDOT is planning to employ one Transportation Technician 1 apprentice for each Region. Apprenticeship Programs have consistently shown that “home-growing” employees results in reduced absenteeism, reduced turnover, and increased productivity.

Kansas Department of Transportation (KDOT)

Kansas Department of Transportation (KDOT) and the Kansas Contractors Association (KCA) have established a new training program that will develop a highly skilled workforce to serve the state's transportation needs.

KDOT oversees the program's curriculum, and has the option of sending its own employees to the relevant courses. In turn, KCA is charged with providing the instructors, facilities, materials, and administration to organize the courses, which will be held all across the state.

The program is designed to give construction workers the additional skills they need for career advancement, which should increase the construction industry's retention rates. And it will generate awareness to attract new workers to the industry. For example, one of the program's priorities will be to increase the number of women and minority workers participating in the training courses.

Nebraska Department of Roads (NDOR)

The NDOR's Succession Planning Program provides employees with an opportunity to become leaders for tomorrow.

NDOR's overall training curriculum includes a variety of training tools and formats including classroom, web-based, on the job training, as well as the partnerships with the Community Colleges. These formats allow for various learning styles and gives the employee the opportunity to learn the way that is most appropriate for them.

CONCLUSION

Given the challenges faced by Departments of Transportations in the United States, recruiting and maintaining a skilled workforce will be difficult. DOTs cannot simply wait for the workers to come to them. The DOT must actively develop and recruit future employees.

The DOT must reach out to and become part of the education community as early as possible. Visiting the classroom at all grade levels starting in kindergarten and staying in the schools thru 12th grade. DOTs must have a presence at the college and university level.

The DOT must aggressively recruit those individuals with the skills needed to operate a 21st century transportation system.

The DOT must continually train their workforce. New and better ways to build and operate transportation systems are always on the horizon. The DOT workforce must be ready for them. Training will keep your workforce at the cutting edge. Keeping your workforce at the cutting edge will help DOT to keep employees.

RESOURCES

The Human Resources and Training Divisions at the Following Departments

Arizona Department of Transportation
Idaho Department of Transportation
Kansas Department of Transportation
Nebraska Department of Roads
Nevada Department of Transportation
New Hampshire Department of Transportation
North Dakota Department of Transportation
Virginia Department of Transportation
Washington State Department of Transportation
West Virginia Department of Highways