

**Developmental Evaluation of the
Transportation Education Development Pilot Program
at the
Transportation Research Center
University of Vermont**



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Introduction

In 2008 the University of Vermont Transportation Research Center (UVM TRC) was awarded a four-year grant from the Federal Highway Administration to conduct a Transportation Education Development Pilot Program (TEDPP). The TEDPP had two main goals: encourage new entrants into the field of transportation and increase the efficacy and retention of the current transportation workforce. (The original proposal is available as Appendix A.) TEDPP was composed of four distinct projects:

- Transportation Systems Institute (TSI)-intended to build leadership and management skills of incumbent workers in state Agency of Transportation workforce.
- Transportation Systems Academy (TSA)-focused on new entrants into the field of transportation, particularly highway maintenance and operations.
- Community Colleges and Transportation (CC) – sought to gather data from community colleges throughout the country in order to determine current and future transportation related education available at community colleges.
- Second Careers in Transportation (SCT) – planned to encourage retired or mature workers to consider second careers in the transportation sector.

Although each of these initiatives utilized evaluation methods during the project implementation (i.e. satisfactions surveys, pre-post assessments, see Appendix B for 2011 Transportation Research Board paper), the TEDPP director was interested in a comprehensive developmental evaluation for the program. A developmental evaluation is especially appropriate for socially innovative programs, such as TEDPP, which involve complex systems that often “cross sectors, involve changing dynamics, roles, and relationships between many players, and challenge conventional wisdom about the nature of the problem and its solutions” (Preskill & Beer, 2012, p. 2). The strength of developmental evaluation is the help it provides to decision makers in seeing the larger system of which the project is one piece, and helping the project adapt to the context of that system. Ideally, developmental evaluation begins with the start of the project and is on- going, but it can be conducted in a retrospective manner, as was the case with the TEDPP evaluation (Patton, 2010). In a developmental evaluation, the evaluator is a strategic learning partner with the project team. While some aspects of developmental evaluation use traditional evaluation techniques, a developmental evaluator also acts the role of an observer of formal and informal systems beyond the traditional evaluation framework.

While the data gathering techniques will be outlined in the methodology sections, all of the findings of this evaluation were discussed with the TEDPP project team on an on-going basis via twice monthly meetings, e-mails and phone calls. This enabled the current programming to develop and change as appropriate and influenced future project activities. The goal of a developmental evaluation is always learning and providing useful information to project planners on continuous basis.

Each of the four TEDPP projects was considered individually, with primary emphasis on the Transportation Systems Institute and the Transportation Systems Academy. There was a significant amount of overlap between a few of the projects, and that will be discussed. This summary document is composed of individual evaluation reports for each of the four projects. The individual reports were originally written as stand-alone documents, so some redundancy and overlap is evident.

Supporting material for this report is referenced as appendices and is either attached to this report or, for longer pieces, a link is provided to the document on the UVM TRC Workforce Development website.

Evaluation of the Transportation Systems Institute

The evaluation of the Transportation Education Development Pilot Program (TEDPP) began in July 2012. The purpose of this evaluation, which is developmental in nature, was not only to capture the successes, challenges and lessons learned from past TEDPP activities but also to look forward and provide a foundation for the development of future programs. The Transportation Systems Institute (TSI) was the first of the four TEDPP programs to be examined during this evaluation process.

The TSI was organized as a multi-day professional development series for transportation professionals working for state agencies of transportation in Maine, New Hampshire and Vermont. The TSI was conducted during 2010 and 2011 and included two cohorts totaling 26 transportation professionals from the state transportation agencies in Maine, New Hampshire and Vermont. The intent of the TSI was to address succession planning, capacity building and professional skills in the existing transportation workforce.

The TSI evaluation consisted of semi-structured interviews with organizers and instructors of the program. Additionally, TSI participants were surveyed and focus groups were conducted with participants in each state. Related documents were also reviewed. The results of the data collection indicate the TSI participants benefitted from the program. Making connections and building relationships with peers from other states proved to be a key outcome of the TSI along with developing communication, facilitation and general leaderships skills. Nearly all participants felt their approach to their work was enhanced by the TSI.

Future considerations of the program include the inclusion of other northeastern states along with additional curriculum topics including an enhanced focus on leadership, supervision and general management skills. Involving future TSI participants as consultants to projects in the state transportation agencies would also provide immediate application of theory and skills learned in the TSI. Additionally, developing professional communities of practice for TSI participants, beyond the completion of their TSI experience, would also help ensure the mutual engagement of participants and ongoing learning as transportation professionals.

The TSI holds promise as a national model for the continuous professional development of transportation professionals. The TSI helped address the issues of knowledge transfer and succession planning facing state transportation agencies and hopefully help ensure strong skills in future transportation leaders.

Introduction

The TSI concept was first initiated during the TEDPP planning stages in 2007. The planning process included representatives from the University of Vermont (UVM), the Vermont Agency of Transportation (VTRANS) and Vermont Technical College (VTC). The focus of the TSI was aimed at mid-career workers from multiple fields in state transportation agencies from Maine, New Hampshire and Vermont. The intent was to build leadership skills as well as address issues of succession planning and knowledge transfer in an aging workforce.

After the TEDPP grant was awarded, a TSI advisory group was formed and needs assessment ([see Appendix C](#)) undertaken during 2008-2009. The TSI curriculum, based on the needs assessment, was subsequently developed and the first cohort began in January 2010 and completed in June of that year. The TSI curriculum is available in Appendix D. The second cohort was enrolled in the program from January through June of 2011. A total of 26 individuals attended the TSI including 9 each from New Hampshire and Vermont along with 8 participants from Maine. Subsequent TSI activity involved an outreach program to municipal transportation workers as well as additional webinars.

This developmental evaluation of the TSI is intended to examine the strengths and challenges of the program as experienced by the developers, instructors and participants. An important emphasis is placed on incorporating the lessons learned into recommendations and a foundation for future TSI initiatives in both the original states and beyond.

Procedures and Methodology

Data for this study were collected from various sources during the months of September through November of 2012. Interviews were conducted with TSI developers from UVM, VTC and VTRANS and TSI instructors. TSI participants were invited to attend facilitated focus groups and to complete an online survey about their TSI experience. Documents relating to the needs assessment and other related material were also collected and reviewed. These sources of qualitative data were analyzed by searching for common themes throughout the data (Patton, 2002).

TSI Developers and Instructors

Private interviews, about one hour in length, were conducted with four individuals involved in developing the TSI and the two primary TSI instructors. Interviews were conducted either face to face or via telephone. A semi-structured interview guide was developed and with permission, interviews were recorded and subsequently transcribed.

TSI Participants

All TSI participants were contacted and invited to attend a focus group session of about one hour to review and comment on their TSI experience. Groups were held in each of the three state agencies of transportation offices and were facilitated in person by the TEDPP director. The focus groups were attended via phone by the evaluator who also recorded the session, with participant permission, and annotated the recording for review. A total of 19 individuals attended the focus groups including seven each from New Hampshire and Vermont and 5 from Maine.

Participants were also sent an online survey consisting of nine, primarily open-ended questions. Those who did not respond after a second reminder were subsequently contacted for a telephone interview and survey completion. A total of 24 responses were received using this method for an overall completion of 92%. Two individuals from Maine did not respond to repeated requests for phone or online survey completion.

Documents

The following items were reviewed for the TSI evaluation:

- TEDPP presentation report (11/2010)
- TEDPP quarterly reports
- TSI needs assessment
- TSI curriculum outline
- TSI participant satisfaction surveys
- TSI participant video

Findings

The findings in a developmental evaluation such as this are both retrospective and prospective in nature. While the findings will help illustrate and understand what did transpire in the TSI program, they will also serve to cast light on how the TSI could evolve in the future. This is somewhat different from traditional program evaluation that seeks to align program outcomes with program goals in measure of fidelity to the goals (Gamble, 2008; Patton, 2010). As such, these findings concerning the TSI will seek to answer inquiries concerning the intended goals of the TSI, program outcomes and strengths, and considerations for future TSI development.

Intended Goals

There were a variety of goals for the TSI that varied somewhat by stakeholder perspective. Most of the TSI developers expressed intent to impact the aging workforce issues present in the state transportation agencies involved in the program. This included addressing needs such as succession planning (in the light of anticipated retirements), mentoring, and knowledge transfer along with new skills in finance and project management. There was also a desire to conduct job

rotation within departments as well as job visitation and shadowing between states. It was also a goal that TSI activity would help build additional transportation education expertise at UVM and contribute to the TRC as a revenue source.

The TSI instructors saw the goals somewhat differently. Their goals for the program involved building leadership and management skills in general preparation for the future. Although not mutually exclusive with succession planning, it did not carry the specific knowledge transfer and job shadowing aspects of the developers' goals.

Interestingly, participants did not have a clear idea on the goal of the TSI. When asked about how they could have been better prepared for the TSI, about 90% said that they would want more information about the TSI before the course started. Including topics to be addressed as well as expectations from the instructors and from their agency leadership was also noted. One participant mentioned,

"A clear expectation from the start would have been beneficial. This could have come from our state DOT front office to describe why they have invested in this initiative and what they hoped the outcome would be. I think the instructors tried to shape an outcome that may or may not have been what our leaders wanted."

Outcomes and Strengths

Nearly all of the TSI developers felt that most of the goals they had for the program were met. The exception was job rotation/shadowing that proved to be too difficult to accomplish for reasons having to do with human resource logistics and labor rules. The instructors felt that all of their goals for the program were accomplished. They thought the TSI helped boost the leadership skills of the participants, in particular for a group that particularly needed professional development. The instructors also noted the incorporation of technology into the program; in the form of e-readers, tablet computers, wikis and webinars was a positive addition and outcome of the TSI.

When asked about the most important information from the TSI, 50% of participants mentioned the value of building relationships with their peers in their own and other states. The developers and instructors also noted the tri-state relationship as being a somewhat unexpected but very positive outcome from the TSI. Participants frequently commented that now they can call or contact a peer in a neighboring state to ask for advice or resources and that this was a very valuable outcome from the TSI.

Figure 1 displays responses from participant surveys when asked about the most important information learned from the TSI and the tool used the most frequently in their professional work.

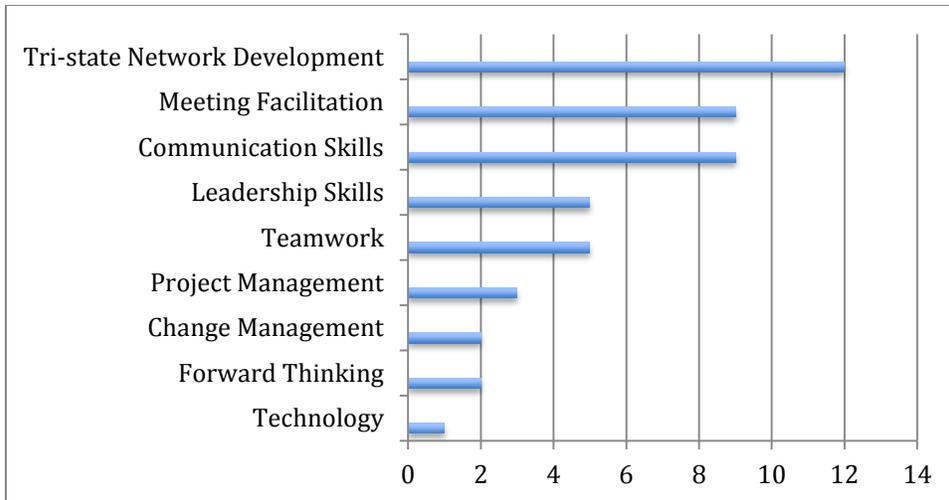


Figure 1. Participant perceptions of TSI tools and information

(Note: more than one answer per participant was possible)

When participants were asked if their job or work had changed since TSI completion, 19 (n=21) answered ‘yes’ with six individuals earning a promotion. Others, who felt their job had changed, mentioned that they now approached their work differently, had more opportunities or had fresh energy and enthusiasm for their work.

In terms of TSI impact on their future career, most participants mentioned a growth in leadership and management skills, a better awareness of change management and future planning and the benefits of additional exposure and contacts within and beyond their own organization. One participant mentioned:

“I think the leadership skills and meeting skills will help me advance. I also think the relationships I have formed with other members from my state are priceless. I didn’t have contacts in these other bureaus before like I do now.”

Yet another participant noted:

“TSI raised my awareness of the need for change, planning for the future, and working with others to make it happen.”

Considerations for Future TSI Development

Data collected from the TSI developers, instructors and participants was uniformly in agreement that the TSI was a valuable professional development opportunity for transportation professionals and should be continued and expanded in the future. Expansion of the program to encompass more states Northeastern was encouraged.

Suggestions for future program aspects ranged from logistics to curriculum and pedagogical improvements. These include:

- Content and learning centered around action learning project either within a home state or a bordering state. Use participants in TSI as a consulting group to address issues within an agency
- Clear support and buy-in from state agency leaders
- Less content on transportation finance and more project management
- Better preparation of participants
- Ensure a cross-section of job functions (HR, finance, operations, engineering, etc.) represented from each state
- Facilitation of the group after the formal TSI sessions end. Consider developing professional communities of practice

When asked about content for future professional development opportunities, participants put forward a host of suggestions. These topics are shown in Figure 2. Note that by far, most participants indicated a future interest in leadership, supervision and management skills to help them manage people more effectively especially in the public sector.

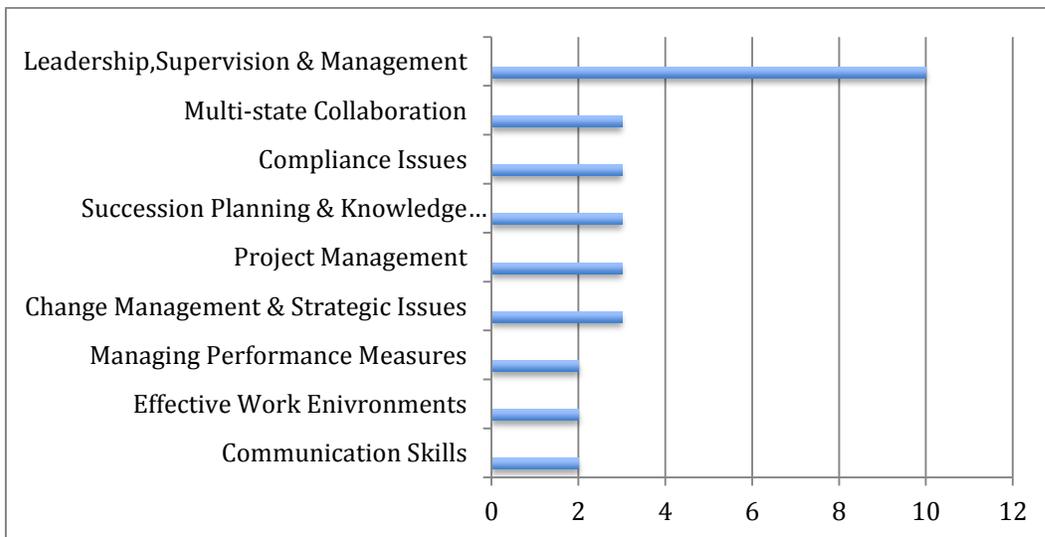


Figure 2. TSI Participant suggestions for future professional development

(Note: more than one answer per participant was possible)

Suggestions for course delivery mode and logistics found a preference for a hybrid of face-to-face and online instruction. In focus groups, participants frequently noted the benefit of meeting face-to-face but also expressed frustrations with the challenges of travel and time out of the office. Results from the survey question concerning preferred delivery mode are in Figure 3.

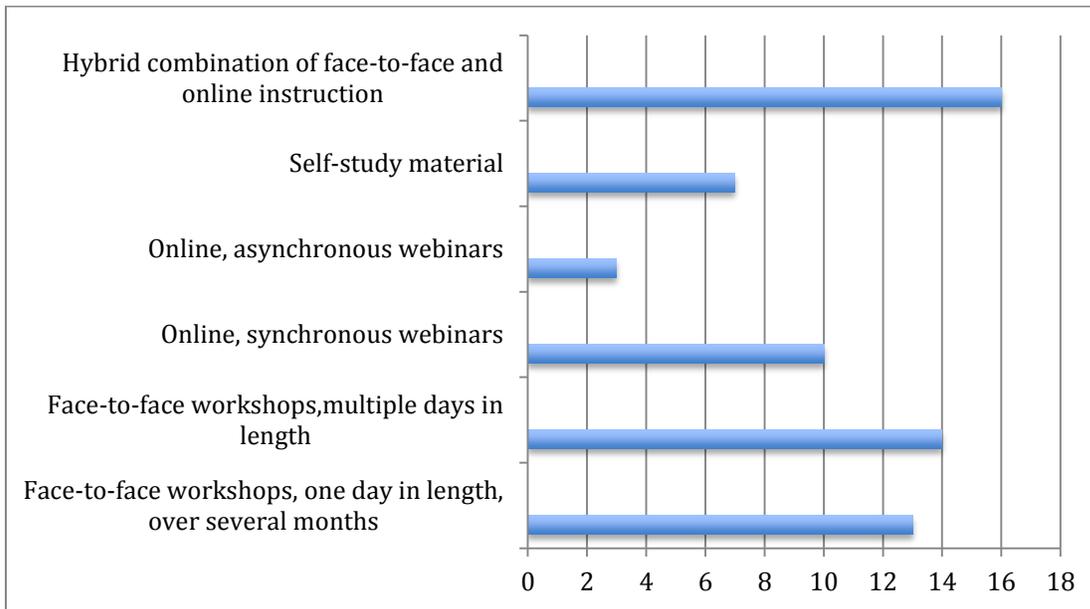


Figure 3. TSI Participant preference for future delivery mode

(Note: more than one answer per respondent was possible)

Summary

Overall, the TSI should be considered a success. Although some of the anticipated goals were not addressed, the institute did serve to build important skills in the participants that will be needed as these professionals advance within their organizations. Solving the issues of an aging transportation workforce and successful organizational transition depend on workers who are not only experts in their functional areas but also know how to lead and manage people, communicate within and beyond their organizations and effectively set and meet goals. The TSI curriculum, with continuous feedback and improvement, can serve as a national model for transportation professional development. Future TSI developers should build upon the unexpected outcome and benefit of having participants from several states learning together and forging collaborative bonds.

Finally, it is important to note that the TSI depended on partnerships between a university transportation center, a state technical college, and state agencies of transportation. While partnerships are not always easy to manage and sustain, they offer strength to the TSI and provide an important foundation for a successful program.

Evaluation of the Transportation Systems Academy

The evaluation of the Transportation Education Development Pilot Program (TEDPP) began in July 2012. The purpose of this evaluation, which is developmental in nature, was not only to capture the successes, challenges and lessons learned from past TEDPP activities but also to look forward and provide a foundation for the development of future programs. The Transportation Systems Academy (TSA) was the second of the four TEDPP programs to be examined during this evaluation process.

The TSA was organized as a multi-day program offered to potential entry-level transportation employees. The initial TSA offerings were held in 2010 and 2011 in conjunction with the Community High School of Vermont (a high school operated by the Department of Corrections) and an additional Vermont high school. In 2013, a Vermont high school, and two Career and Technical Centers offered the TSA, one to a traditional high school aged group and another to adult students.

Data was gathered for this evaluation primarily through semi-structured interviews with project partnering organizations, instructors and participants as well as a review of relevant documents. Data show a successful pilot project that resulted in much learning for both participants and the various partner organizations involved. TSA highlights and strengths included the sound curriculum, which was delivered in an interactive manner by highly experienced transportation professionals. Of greatest benefit to the participants, was the certification in flagging obtained through the TSA as well as an introduction to Commercial Driver's License requirements and experience. Adult students also benefitted from the same curriculum but brought a new set of challenges including scheduling, funding and for corrections students, issues of attendance, possible future placement and restrictions inside correctional institutions.

Future considerations for the TSA include outreach to other special adult populations, such as Veterans and instruction in heavy equipment as well as a sustained internship experience. Expanded linkages with potential transportation employers, in all transportation sectors, are also recommended.

One of the most successful aspects of the TSA was the orchestration of the effort by the UVM Transportation Research Center (TRC). The various partners looked at the TRC as the catalyst that brought disparate organizations together and provided the expertise and funding to operate the TSA. As noted by nearly all TSA partners, the TRC was essential to the current project and looked at as being vital to the future growth of TSA activities.

Introduction

The Transportation Systems Academy (TSA) was developed as one of the four primary programs of the Transportation Education Development Pilot Program (TEDPP). TSA was created as an educational program for potential entry-level employees at the Vermont Agency of Transportation (VTRANS) in collaboration with the University of Vermont Transportation Research Center (UVM TRC), Community High School of Vermont (CHSVT) and Vermont Local Roads, the Local Technical Assistance Program (LTAP). These entities recognized the need of VTRANS, town road departments and private sector employers for entry-level workers while CHSVT, which oversees education for people under the supervision of the Department of Corrections (DOC), had a desire to expand education and employment opportunities for its students.

The collaborating organizations developed a 96-hour curriculum (see appendix E) that was first piloted inside a Vermont correctional facility in 2009. Subsequently, in 2010 the TSA was also offered at two different locations and to other audiences. A Vermont high school included the TSA in their Building Trades curriculum while the TSA was also operated on a Vermont Probation and Parole campus to a mixed group of supervised parolees and older adults preparing for employment. Subsequently, the TSA was presented during 2013 in three locations. These include a Vermont high school, a Vermont career and technical center (CTE) with a high school age population, and at an additional Vermont CTE as part of their adult education program.

This developmental evaluation (Patton, 2010) of the TSA project is intended to examine the strengths and challenges of the programs as experienced by program organizers, teachers and participants. Emphasis is placed on lessons learned through the TSA pilot programs that are applicable to shaping future TSA-related offerings.

Procedures and Methodology

Data for this study were collected from a variety of sources beginning November 2012 through March 2013. In addition to document review, key sources of data were individual interviews conducted with program personnel and participants. These semi-structured interviews ranged from 30 to 90 minutes in length and sought to understand the background, strengths, challenges and recommendations for the TSA. Interviews were transcribed and then coded using HyperResearch software and common themes were established that aided in evaluation efforts (Patton, 2002). In addition, the evaluator was able to accompany the TSA program planner to site visits during the planning process for spring 2013 TSA classes.

TSA Developers and Instructors

Private interviews, about one hour in length, were conducted with eleven individuals who were involved in either designing and/or delivering the TSA curriculum during 2009 and/or 2013. This included representatives from UVM TRC, CHSVT, VTRANS, a trainer formerly with Vermont Local Roads, a Vermont high

school and two Vermont career and technical centers. Additionally, a representative from Associates for Training and Development, a non-profit that provides job training opportunities to individuals 55 years of age and older was also interviewed.

TSA Participants

Only two participants were able to be located and were interviewed for this study. This is a limitation of this evaluation, but highlights the issue of mobility and maintenance of current contact information for participants. However, the interviews conducted were data rich and added to the evaluation efforts.

Documents

The following documents were reviewed for the TSA evaluation:

- TEDPP presentation report (11/2010)
- TEDPP quarterly reports
- TSA curriculum outline
- TSA media reports
- TSA posters and material
- TSA curriculum

Findings

The findings in a developmental evaluation are both retrospective and prospective in nature. While the data gathering was intended to understand what did occur during the initial TSA offerings in 2010-2011, this evaluation process was enhanced by involvement with the planning process for new TSA programs being held in Spring 2013. These findings then seek to address questions concerning the intended goals and program outcomes, partner contributions and relationships, and considerations for ongoing and future TSA programs.

Intended Goals

The initial goals and objectives of the TSA were outlined in the TSA Case Study documents produced by the UVM TRC and attached to this evaluation as Appendix F. The short-term objective was to support the career-preparation of potential transportation sector employees with the longer-term objective of attracting new workers to the transportation industry from multiple populations, including both youth and incumbent workers. These activities were intended to happen with and through the CHSVT and also with Vermont high schools and career and technical centers.

The CHSVT became involved in the TSA with a goal of seeking more vocational and job opportunities for their students in fields that were closely linked to the Vermont economy. The goal for VTRANS involvement with TSA was aimed at tapping into a pool of potential new employees that would have some initial qualifications to fill operations and maintenance positions in the highway division. The Vermont high school that incorporated the TSA in 2010 was interested in providing exposure with transportation related work for their students in addition to certifications in flagging and heavy equipment. Associates for Training and Development

(participants in the program in 2011) and the CTE adult education offering in 2013 were both interested in developing skills for adults that would lead to employment.

Outcomes

The initial and subsequent offerings of the TSA provided some expected as well as unexpected outcomes. Interviews with key partners developed several themes that were captured in concept maps. Instructional practices including the curriculum and instructor qualities were key to the success of the program and are represented in Figure 4. Issues unique to an adult population, either with the CHSVT or at a CTE are represented in Figure 2.

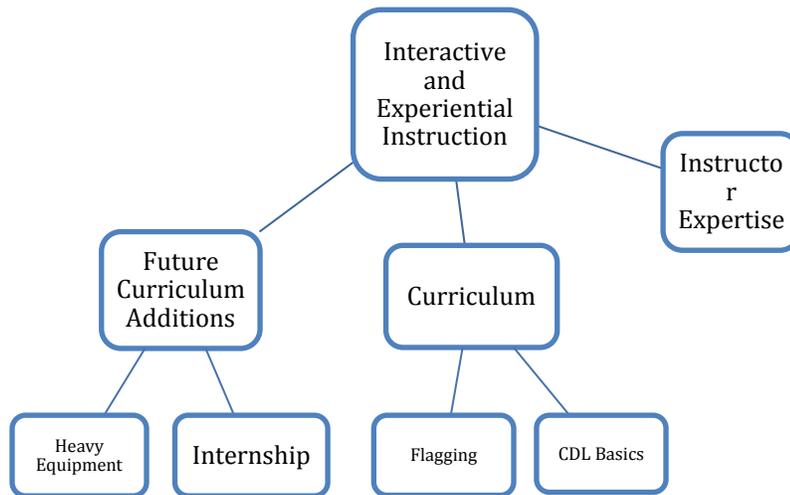


Figure 4. TSA Instructional Practices Findings

Interactive and Experiential Instruction

All groups involved noted good instructional practices as important to TSA success. Interactive and hands-on instruction was frequently cited as a strength of the program that lead to high student engagement with the material. For example, some instructors brought material into the classroom and had students construct a model road. Others arranged for field trips to the local VTRANS or municipal garage so students could operate or view equipment. A CDL simulator was brought to instructional sites for student instruction.

“We made a road right down the middle of the room. There were buckets of gravel along with eggs and mini culverts. We built a road different ways, stood on them and found out which ones crushed and which didn’t.”

TSA Instructor

Curriculum

The curriculum content and instructor qualities emerged as two themes that were specific strengths of the program. The curriculum, developed by UVM TRC working with Vermont Local Roads and VTRANS, was thought to embrace all the basics for entry level workers at VTRANS and would encourage participants to consider a career in the field and help lead to employment at VTRANS, a local road department, a private road contractor or an employer in a related field. Of particular note were work zone flagging and Commercial Drivers License (CDL) Basics. Work zone flagging, which was taught by a certified instructor, resulted in students earning their American Traffic Safety Service Association (ATSSA) certificate. In conversations with TSA participants (or information from program partners) it was often mentioned how the flagging certificate lead to entry-level employment. This employment may have been in transportation or in transportation related field such as a private construction company, utility or logging operation.

The CDL Basics course was also often noted as a highlight of the curriculum because of employment preparation. Although students did not receive their CDL through the TSA course, they were prepared to continue on for licensing more fully understanding what was necessary and how to go about the process.

“The CDL instruction with the simulator was the most important part of the course for me because of the hands-on. And the flagging certificate really helped me out too when I got a job. I applied for my CDL and got my permit and got hired by a construction company. When I’m 21, my company will help me get my CDL and pay for it too. But learning about the log book and pre-trip inspection through the CDL course helps me on the job even now.”

TSA Graduate

Instructor Expertise

The instructors for the transportation specific TSA courses were experienced professionals drawn from VTRANS, Vermont Local Roads and professional organizations such as the Association of General Contractors. Their expertise in the subject matter helped them engage and earn respect from the students. Additionally, the instructors were experienced trainers who also brought sound instructional practices into the classroom. Other courses, such as Construction Math and CPR were lead by instructors who were often part of the sponsoring school.

“The instructors deep expertise was essential to the course. They were also well organized and had connections to the local garage where students could try operating some pieces of equipment.”

TSA Vermont School Partner

Future Curriculum Additions

While the curriculum was thought to be sound, two suggestions for additions to future offerings emerged from the interviews. These additions are 1) introduction to various types of heavy equipment as well as 2) a required internship. Just as flagging certification can lead to entry-level employment, basic operational knowledge of heavy equipment used in construction and transportation helps a new employee become ready for immediate work. A sustained, multi-week internship, either with a public or private employer, was also frequently suggested as a curriculum addition to aid with career paths and work readiness. It should be noted that the original curriculum did plan for both job shadowing (8-16 hours) and internship experience (40-80 hours) but in most cases was not achieved due to a variety of circumstances. The over-riding event was the impact on State and local transportation crews in the aftermath of tropical storm Irene that hit Vermont in August 2011.

“I visited the classroom a few times and it was a very engaging and non-threatening atmosphere for adult students, who often are hesitant to re-enter a classroom. The only piece that was a disappointment was the lack of internships due to Irene. If there had been internships this would have lead to jobs.”

Adult Student Advocate

Adult Student Issues

TSA programs that were focused on adult students carried some unique challenges that are diagrammed in Figure 5.

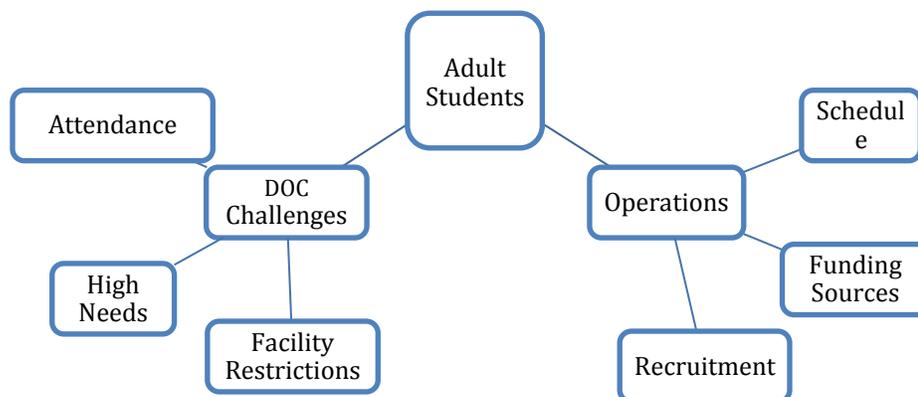


Figure 5. TSA Adult Student Issues

Department of Corrections Challenges

TSA programs that were operated with the Department of Corrections (either inside a correctional facility or at a probation and parole campus) had some unique challenges. Restrictions inside a correctional facility, such as the type of equipment that could be brought inside, schedule changes and timing lead to curriculum adjustments. Some of the important hands-on elements of instruction could not be accomplished inside a facility. Outside field trips and experiences were also restricted.

"I wouldn't offer the TSA at a correctional facility again. There were just too many barriers to hands-on learning inside the facility."

Department of Corrections Official

Attendance, both for those inside the facility and for students at probation and parole centers, was problematic. Inmate location changes and lack of follow-up for other students lead to poor attendance. DOC Students who had what DOC officials consider to be high employment needs also had greater needs in other life-skill areas including unstable living situations. This made attendance and follow through with the TSA program challenging.

Operations

Operating a TSA program for adult students at CTEs had specific challenges. Unlike high school age students, adult students need to be specifically recruited into TSA through outreach and marketing efforts. In addition, CTE adult programs carry a cost to the student that must be funded by the student or a sponsoring agency (such as an employer, Vocational Rehabilitation, Vermont Student Assistance Corporation). This cost and funding can be a significant barrier to student enrollment especially to those who need employment and job training the most. Adult students also need a training schedule that can compress learning develop job skills on a shorter timeline. While high school students may be able to engage with the TSA curriculum over a period of many months, adult students would benefit from a shortened timeline.

Other TSA Outcomes

There were other outcomes from the TSA pilot project that were evident from interviews and observations. The first is a lack of direct job placement in transportation of TSA graduates. Only a handful of the nearly 50 TSA participants in the early pilot programs had found jobs in transportation or transportation related fields upon program completion. This number may be higher, but lack of available follow-up data on participants makes this unknown.

The valuable role of the TRC was evident throughout the evaluation process. The TRC was acknowledged as the entity that brought collaborators together and

facilitated the development of the TSA. Partners saw UVM TRC as being very valuable to the TSA in terms of advice, visibility and program continuation. As one partner representative noted:

“The TRC and Glenn have been great; they were the organizers to get everybody at the table. They opened doors for us with VTRANS and with their workforce development. Prior to TRC’s work with us on the TSA, my organization did not have a relationship with VTRANS.”

Program Partner

The larger TEDPP effort had projects aimed at both second career adult workers and community college involvement. The TSA development also served to involve organizations from both of those sectors. Associates for Training and Development is a non-profit that works with displaced workers age 55 and over. They participated in the Rutland based program offered at a probation and parole office. These participants were provided with various supports for the program and had a 100% completion rate for their 8 attendees. Although no specific job placements could be attributed to TSA completion, Vermont Associates is enthusiastic about TSA and looks forward to additional offerings of the program. They also established a relationship with VTRANS that had not previously existed leading to possible related collaborations regarding workforce development.

The Community College of Vermont (CCV) in 2012 instituted a new Associates Degree in Applied business, with a transportation focus. Although the TSA does not carry college credit, CCV has offered a portfolio review process for students who have completed the TSA. This could result in up to 12 college credits for students who wish to earn the Associates Degree. This is a bonus from the TSA that will help in developing transportation career pathways for students.

And although the CHSVT has decided not to continue the TSA in its current form, they have taken steps to add a highway heavy equipment training program to their curriculum. In early 2013, six CHSVT staff were certified by the National Center for Construction Education and Research (NCCER). NCCER is an organization that provides training material, assessments and documentation for students in construction career related programs. CHSVT staff look forward to beginning this program soon and placing students in transportation related jobs. They credit their experience with the TSA as the impetus for advancing this new program.

Considerations for Future TSA Development

Interviews, observations and reviews from all TSA partners found overall enthusiasm for the pilot project and a desire to continue to offer and further develop the TSA in the future. The pilot projects of 2010-2011 and 2013 all contributed to learning how to fine-tune TSA for future offerings. Suggestions for the future include:

- Institute a comprehensive public relations campaign emphasizing the opportunities in transportation careers. This should be aimed at various audiences including educators/guidance counselors, parents and students of all ages. Special campaigns for special populations such as Veterans or displaced workers should also be developed.
- Develop strong relationships with transportation employers, in both the public and private sectors. These employers can publicly endorse the program (as VTRANS recently has) but also serve as sites for internships.
- Make curriculum adjustments as mentioned in this report including a strong internship experience. This will aid in making job placements and employment possible.
- Grow the instructor pool. While enough qualified instructors were secured for the pilot program, others will need to be recruited, trained and supported if the TSA is to expand throughout Vermont. TRC is currently working with VTRANS to initiate an instructor development program for potential trainers and much will be learned from this new effort.
- Expand the TSA to include training in other modes of transportation. While the “Transportation 101” course does provide an overview to the transportation industry in general, some of the other courses are more specific to highway transportation. As the TSA program grows, it might be possible to offer specific courses in other transportation modalities. This might be dependent on location, e.g. a strong introduction to Maritime, Pipeline, or Aviation in Northwestern Vermont closer to those key employers.
- Enhance linkages with the adult learning community through the adult coordinators at all CTEs and other adult education service providers such as Vocational Rehabilitation, Parent-Child Centers, Department of Social Welfare, Vermont Works for Women and others.

Summary

The development of the TSA was very much a pilot project that provided learning for all involved. Although actual job placements in transportation positions may have been low, the program was successful in establishing a valuable curriculum, bringing partners together, initiating the conversation about training for transportation jobs and helping develop a mechanism for facilitating that training. The TSA may very well be considered a model pilot program that has helped raise the awareness of transportation related careers in Vermont and seems well positioned to expand in terms of geography, audiences and scope of instruction.

Evaluation of the Second Careers in Transportation

Introduction

The Second Careers in Transportation (SCT) project did not lend itself to as methodologically detailed evaluation as the TSI and TSA. The SCT was intended to interest, train and recruit mature or retired workers over age 50 into professional positions in the transportation sector. Over the length of the TEDPP, the SCT project evolved into both a major data gathering effort and exploration of employment opportunities in transportation for the growing population of mature workers in Vermont.

Procedures and Methodology

Data for this evaluation were gathered from a variety of sources from November 2012 through May 2013. Data gathering overlapped with the TSA evaluation and benefitted from the intersection of the two efforts. Data collection involved interviews, a focus group, surveys as well as document review.

TEDPP Personnel and Partners

Informal interviews were conducted with various TRC personnel as well as community partners in the SCT project. Late in the spring of 2013, a TSA session was offered for adult students at a Career and Technical Center outside of Burlington. Students in that class participated in a short focus group about their experience and completed surveys regarding their experience.

Documents

In addition to the documents reviewed for the TSA evaluation, the Second Careers in Transportation Needs Assessment Analysis was also reviewed.

Findings

The findings of the SCT evaluation fit the developmental evaluation particularly well. While the project attended to the overall goals, the expected partners, pathways and participants took unanticipated turns.

Intended Goals

According to the SCT documents, the project had three goals. These goals were 1) gauge level of awareness of the transportation industry by the mature worker audience, 2) attract older workers to consider professional positions in transportation and 3) provide the link between older workers and transportation job opportunities, primarily those who have recently retired from other industries

with needed skills. It was expected that AARP Vermont would be a strong partner with UVM TRC along with an advisory committee.

Outcomes

While some of the specific SCT goals were not quite reached, the SCT did address the overall recruitment and preparation of candidates for careers in transportation. This was accomplished primarily by partnering with Associates for Training and Development and other adult training and education organizations.

Partnerships

Associates for Training and Development is a non-profit that specializes in training and providing employment support for individuals over age 50. Associates supported seven participants in a TSA course held in the Rutland area and is eager to repeat this experience when participants and opportunities arise. Although none of the participants were known to have subsequently become employed in transportation related work, the linkages between UVM TRC, Associates and VTrans is now established and ongoing.

Early in the program the Vermont Chapter of AARP was also an active partner contributing advice and identifying resources on understanding age responsive workplaces. TRC staff conducted a survey of the field, and report on applying general information and experience to the transportation sector. The report, *"Second Careers Research & Application to Transportation Workforce Summary"* is found in Appendix G.

TEDPP also initiated a relationship with Vermont Works for Women, a non-profit that supports and trains women for entry into non-traditional jobs. Seven women, of varying ages and a majority new Americans, participated in the spring 2013 TSA offering for adult students. The students were enthusiastic about their learning and survey results showed that half were interested in more transportation related learning while a majority were planning to apply for a transportation job within the next year.

Additionally, TEDPP established a working relationship with Vermont Department of Labor, Veteran liaisons. The TRC has participated in Veteran job fairs and is establishing a presence as a resource for Veterans seeking transportation jobs.

Needs Assessment

A product of the SCT initiative was the SCT Needs Assessment. This assessment was completed in two phases by the TRC and the UVM Center for Rural Studies in May 2011. The first assessment focused solely on employers in Vermont with an instrument that asked about current and potential jobs and job openings for administrative, professional or skilled labor in transportation. 207 organizations responded (41 private and 166 public sector) the results did not lead to any important conclusions regarding mature workers and the transportation industry. However, the data did point to a need for people to fill positions in general labor,

trucking and equipment operations with the CDL being the most sought after certification. The second assessment, conducted in 2012, focused on New Hampshire and Maine and updated the Vermont survey of positions at state DOT with a look at geographic distribution as well as overall number of positions. This provided a uniform three state view of transportation jobs in state government across northern New England. Private sector employer responses were generally absent, possibly due to the uncertainty of future projects. The second survey did not provide any new conclusions but did confirm that there was an ongoing steady need for workers in the transportation field, especially highway maintenance and operations, and that those jobs were geographically dispersed across each state.

Considerations for Future SCT Development

It is recommended that as the TEDPP goes forward and moves into an established phase of operation, SCT could cease to stand alone as a separate project in the overall program. It has become quite evident that a separate education or training program does not need to be developed for adult student seeking second careers. The TSA, and perhaps enhanced versions of the TSA, has served and can continue to serve as an entry point for adults who wish to begin careers in the transportation sector. Customized outreach material could however be developed to speak to each of the special populations who are potential students for TEDPP programs. Additionally, UVM TRC should continue to work with the organizations that support these populations to enhance success in transportation education and careers.

Summary

The SCT initiative helped the TEDPP engage with experienced workers in special populations beyond the original mature and retired population. In working through the complex system that is the adult education landscape in Vermont, the most notable outcome was the partnerships that the UVM TRC developed with organizations that are already established and experienced in working with adults who are in career transition. This includes Associates, the Department of Labor, Vermont Works for Women, the Community College of Vermont and the adult coordinators who serve at career and technical centers. These relationships are emblematic of the sorts of unintended consequences of socially innovative programs that evolve and contribute to program outcomes yet cannot be predicted in the planning stages.

Evaluation of the Transportation and Community Colleges Initiative

Introduction

The TEDPP Community Colleges (CC) project was initially conceptualized as a national summit of community colleges with a focus on transportation education and training. The summit was intended to follow a comprehensive national survey of community colleges in order to gauge the level of transportation related programming occurring in community colleges.

The review of the CC project again did not follow as methodologically detailed evaluation as the TSI or TSA. During the course of the TEDPP, the CC project primarily evolved into a data gathering effort via documents, surveys and work with the local Community College of Vermont (CCV) and outreach to the CC network in New England.

Procedures and Methodology

Data gathering for this evaluation consisted primarily of documents review, partner interviews and the execution of an enhanced and regionalized survey.

Documents

The summary data from the original survey, which was executed in 2009, were reviewed, as were original planning documents. Unfortunately, the raw data from the survey was not accessible, so only the summary report from the data as published by the TRC (Glitman, 2010) could be reviewed.

Regional Survey

In early 2013, a survey of New England Community Colleges was undertaken in order to better understand transportation offerings at those institutions. The survey implementation followed the Tailored Design Method for online surveys (Dillman, 2011). The survey was introduced via a personalized hard copy letter to either the President or Academic Vice President of the college. It was then followed by an invitation to the online survey site and weekly reminders were also sent online. This survey of 35 community colleges had a 57% response rate (n=20) and will be discussed in the findings section of this report.

Interviews

Representatives from the Community College of Vermont were also interviewed about transportation related issues and educational offerings. Interviews were about 30 to 60 minutes in length and sought to gather information concerning transportation related offerings and plans for expansion.

Findings

Intended Goals

The Community College portion of TEDPP was intended to be comprised of both a national survey of community colleges and a follow up summit of survey respondents. The goals of the proposed summit were to:

- Identify the current and potential role of community colleges in providing for transportation workforce development.
- Identify possible transportation careers or positions that are currently or would have the potential to be served by community college courses or a degree.
- Identify the potential curriculum that community colleges presently have in place or could administer that will prepare students for a career in transportation.
- Identify and discuss the issues or barriers community colleges face in being more engaged in transportation workforce development.
- Identify and discuss strategies and processes that may be utilized to address how community colleges can better identify transportation workforce development needs.
- Discuss the role of community colleges in providing continuing education for in-service transportation professionals, how community colleges can work with the transportation industry to identify those needs, and the strategies and processes to provide for transportation professional continuing education.

Outcomes

The resulting outcomes of the CC project were useful but did not meet intended goals. While the national survey was executed, the follow up summit was not created. This was due primarily to the fact the TEDPP personnel began to work with the American Association of Community Colleges (AACC) leadership and realized that the AACC offers conference opportunities on an annual and national basis for their member organizations.

UVM TRC launched the national survey in partnership with the AACC in 2009. Details concerning methodology and results can be found in the resulting report (Glitman, 2010) which was presented at the annual AACC Workforce Development Institute in 2010. The report is available in Appendix H. The survey results answered the first three goals of the CC project, namely a benchmark of existing transportation programs and planned program additions at the colleges (n=167) who responded. The survey did suffer from a rather low response rate of approximately 15%.

National Survey

The national survey of community colleges did produce useful information. The key findings were: 1) about 55% of respondents had partnership relationships with industry and transportation employers 2) 61% of respondents reported shared technical programs that were transportation related and 3) 86% of respondents owned facilities or equipment that supported transportation courses. Conclusions about best practices were also drawn (Glitman, 2010) as well as recommendations for the future. However, due to the lack of raw data, it was impossible to contact these institutions in 2013 in order to follow up on program updates. While the survey served to give a snapshot of transportation related educational efforts at 167 institutions, it was limited by possible response bias.

Regional Survey

A regional survey was launched in April 2013 to the 35 community colleges located in New England states. This survey was similar to the previous national survey, however institutions identities and demographics (size, location) were collected as were individual contact information for those who completed the surveys. (In a few cases, multiple individuals from one institution completed the survey adding information from their specific area of responsibility.) The survey was also enhanced with additional questions by transportation mode, but yet easier to navigate for respondents due to built in survey logic that allowed for question skipping.

The results do provide a baseline of transportation related education available at New England community colleges currently and a look at what is planned for expansion in the near future. Of the 20 respondents, 11 indicated they currently offer programs in general transportation programs, with additional programs being planned in design engineering and transportation logistics. Aviation was the mode of transportation that had the highest number of current and planned programs. The summary report of this survey can be found in Appendix I.

The data from this survey not only serve to provide a snapshot of community college based transportation education, but also served to establish a database of information and contacts at community colleges in New England. This will be useful as the TRC continues its workforce development efforts with a regional focus.

Relationship Building

An outcome from UVM TRC efforts with community colleges was the development of a working relationship with the Community College of Vermont (CCV). As noted previously, CCV recently developed a new degree with an elective concentration in Transportation from a policy and operations perspective. UVM TRC was instrumental in helping bring about a relationship with CCV and VTRANS both for advisory purposes but also for student recruitment. CCV in Vermont provides yet another pathway for students into transportation sector employment as well as continuing education for current employees.

Considerations for the Future

The UVM TRC should continue to build relationships and partnership with community colleges in New England. This can best be accomplished by helping to articulate clear career pathways from K-12 to community colleges for transportation careers and also by supporting, if possible, the curriculum development needs of community colleges. Promoting and encouraging employer relationships with community colleges should also be a focus for the future since these partnerships can help to lead directly to jobs and careers in transportation.

Summary

While the Community College initiative of the UVM TRC did not accomplish all of its original goals, it did have important and useful outcomes. It was the beginning of both knowledge gathering and relationship building. True to social innovation efforts, strategy must often shift to reflect the reality of the innovation, and this is captured in the results of the Community College strand of TEDPP.

Additional Accomplishments

Career Pathways

While not part of the original TEDPP plan, the pilot project was active in the area of transportation career pathways including outreach, leadership and general awareness building. Career pathways are a workforce development concept that works to connect education to employment and careers by articulating a clear linkage between them (Hull, 2005). Specifically, the UVM TRC developed transportation specific outreach material and sponsored career pathways leadership training.

Outreach Material

The TRC developed a series of five “Career Pathways in Transportation” documents by mode of the transportation sector including maritime, rail, transit, highway construction, and public works. Each pathways document includes an introduction to the mode, provides a snapshot of an employer, a graphic of a career pathway from entry level to experienced worker, career biographies of people who are in that career and also a list of transportation education and training resources. The pathways documents can be accessed at the [TRC Workforce Development website](#). The Career Pathways documents are also available in printed form and have been used at career fairs, distributed to CCV, Vermont DOL Veterans counselors and Vermont career and technical centers. A companion piece to the pathways documents is the “Vermont Transportation Industry Factsheet” and the “Transportation Industry Factsheet”. Both documents are also available at the [TRC Workforce Development website](#).

Leadership Training

The UVM TRC also arranged and sponsored a two-day Career Pathways Leadership Workshop lead by Fran Beauman and Carol Jurgens, both members of the Center for Research and Occupational Development. The 24 participants represented a variety of organizations including secondary and technical education, community colleges, Vermont Agency of Transportation, Vermont Department of Labor, Regional planning boards, and Vermont Agency of Education as well as TRC personnel. Participants were enthusiastic about the training and in evaluation surveys felt that the material and information would lead to more partnership building and development of clearer pathways into transportation employment.

Tool Kits

Building on the lessons learned and experience of developing and operating both the TSI and the TSA, the UVM TRC created “tool kits” for other transportation workforce development centers to use in their own educational program development. These tool kits contain resource material and suggestions for the establishment of similar programs along with case studies and vignettes of participants. The tool kits are available online at the TRC Workforce Development website.

Summary

This developmental evaluation allowed for a retrospective look at the activities of TEDPP in its initial four years along with current assessment of the fifth year undertakings. Although TEDPP made progress on each of the four funded programs, TEDPP did not accomplish all of its objectives as initially conceived. This is not unlike many socially complex and innovative programs. For TEDPP, some expected partnerships did not fully develop, (e.g., AARP, Vermont Local Roads) while others that were not on the horizon in the beginning became solid partners (e.g., Adult education programs at career and technical centers). Innovative and valuable activities, such as the Pathways Leadership Training arose while the planned community college transportation summit was found to be unnecessary.

The initial goals of TEDPP, to encourage new entrants into the field of transportation and increase the efficacy and retention of the current transportation workforce, were met through the program's efforts. Current transportation professionals in three states became re-energized about their careers and improved their professional skills, networks and resources through participation in the TSI. While direct numbers of workers into transportation employment through the TSA is low, the TEDPP allowed for a testing of curriculum and building of awareness and skills with a variety of populations beyond the program's original target participants. Tools are now available for dissemination to other regions of the country and awareness of UVM TRC's activity has spread in the transportation workforce education community, particularly in New England. UVM TRC is now well poised to continue, expand and accomplish their transportation workforce goals.

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Appendices

“Transportation Education Development Pilot Program”

Proposal to the USDOT

SUMMARY DOCUMENT

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New Hampshire Department of Transportation
AARP Vermont
Vermont Local Roads (Vermont LTAP)
New Hampshire LTAP at UNH

INTRODUCTION

With demographic changes and the dynamic nature of our 21st century transportation system, the transportation sector needs a comprehensive workforce development plan that includes innovative programs that can be used nationwide to attract and retain skilled workers. This project seeks to create four new curriculum programs to help transportation managers and their community partners attract and maintain workers in this challenging environment. While the proposal includes several nontraditional partnerships, the core work program focuses specifically on state Departments of Transportation (DOT) as leaders guiding academic institutions to build these tools for incorporation into DOT organizations and beyond. State DOTs are the critical lynchpin of the transportation sector.

This team is proposing four activities which address three of the five areas in the request for proposals: A National Strategy for Curriculum Development (Area 1); Community College Curriculum Development (Area 3); and, Regional and State Curriculum Coordination (Area 4). The three states of northern New England will serve as pilot sites for three innovative programs and co-host a National Transportation and Community College Summit. The work plan is sub-divided to discuss the following four specific programs:

- A. The **Transportation Systems Institute** will be hosted by Vermont Technical College and led by current state DOT professionals and targeted at maintaining or recruiting new talent to the state DOT workforce. Timely and relevant topics such as energy, environment or finance will be used to motivate programs for retention and succession planning including job rotation, roundtables and other hands-on activities (Area 4).
- B. The UVM UTC will be lead host to a **National Transportation and Community College Summit**, where representatives of the nation's community colleges will participate in facilitated discussions to create an action blueprint for enhancing the role of community colleges in all types of transportation workforce development (Area 3).
- C. The **Second Careers in Transportation Program** will be piloted with AARP Vermont and utilize the web and other marketing tools to attract retirees from other industries to bring their skills to bear on the 21st century challenges in transportation (Area 1).
- D. The **Transportation Systems Academy** will be piloted in partnership with two state LTAPs to provide hands-on training to students at technical high schools or within the state corrections systems. In addition to leveraging the existing LTAP training programs to provide skills to participants, this effort will expose individuals, particularly young people, to the opportunities within the transportation sector both with private or public agencies (Area 1).

Although only the Summit will involve a national group, the models created in the other three pilot program areas will be of national interest. In addition to conference and journal paper dissemination, we propose extensive web-based dissemination as well as use of the national UTC, LTAP, community college, and AARP networks.

Our approach focuses transportation as a vertically integrated industry wherein human resources move from one level to another within the industry; for example, from federal to state, from consultant to state, from state to construction. From an

overall perspective the State DOTs are clearly the linchpin of workforce development for the transportation industry and for the industry as whole as they serve as the focal entry point into the industry for workers. State DOTs not only have the broadest nation-wide platform from which to attract workers, they are also a national network of employers with connections to the entire transportation industry.

With our cooperative effort among UVM, VTC, three state DOT's and two state LTAP's we have a clear strategy of creating a workforce development plan that has the academic partners supporting the DOTs as they identify their own requirements and practical solutions. Furthermore, since we view transportation as a vertically integrated industry, the DOT needs and solutions will be appropriate for the transfer of human resources among the many units of the overall transportation industry especially those in the northern New England region. In summary, we are focused on recruitment, retention, development, and succession planning of transportation human resources to meet current and future needs with new curriculum programs and partners with national networks allowing for expansion of these programs nation-wide beyond the time frame of this grant.

BACKGROUND

Demographics

"Demographics are destiny" is the chant of accountants who forecast the impact of population growth and age (David Walker, 2005). We know we have an aging population and can easily forecast the impact of this trend on budgets and workforces. Maine and Vermont, two of the partners for this proposal rank #1 and #2 respectively in having the oldest median age population in the nation. Decreasing growth rate statistics from the U.S. Department of Labor indicate that the labor force growth rate was highest in the 1970s at 2.6 percent. The projected growth rate for the decade 2015 to 2025 is only 0.2 percent (Toole, 2004). The Northeast region ranks last in population growth among all US regions (Census 2000 brief, 2001).

What the northeast region lacks in total workers we can make up for in the percentage of older workers. New Hampshire and Vermont ranked second and third respectively for the percentage of 45 years old plus workers in the nation (AARP). In short, New England and especially northern New England are critical within the nation for the challenges of an aging population and stagnant economic growth. This backdrop challenges any effort for workforce development.

Potential Sources of Workers

In addition to the older workers mentioned above, a potential labor pool for the transportation industry are younger potential workers under the care or custody of the Department of Corrections (DOC), but not incarcerated. For instance in Vermont 4,700 persons under the care and custody of the DOC, but not incarcerated are under 30 years of age. (<http://www.doc.state.vt.us/about/reports/ff2006>, web accessed August 22, 2007).

As Vermont's largest high school, the DOC run Community High School of Vermont (CHVT) has a total enrollment of more than 4,100 students: approximately 85 percent male, 15 percent female. (<http://www.ncsall.net/?id=827>, web accessed August 22, 2007). This potential source of workers has largely been untapped by the transportation industry.

Evolving industry

Like all industries, transportation has seen an evolution of skills needed to meet the demands of the 21st century. The industry needs workers adept at handling the ever more complex financial arrangements involved with innovative finance and assessing new revenue sources. The industry needs more environmental and electrical engineers to address the issue of sustainability and the demands of Intelligent Transportation Systems (ITS). The Transportation industry is facing the same workforce challenges other industries confronted that led them to either adapt or fail. One only need look at the re-use of abandoned mills converted into high tech office space to know that not only has the function of the building changed but the work being produced in the factory now requires new skills of the employees and new labor practices from the employer (C. Benner, 2002). The same holds true for the Transportation industry. No longer are there rooms filled with cartographers or engineers designing new highways. Now, the rooms are more likely filled with environmental engineers delineating wetlands, financial analyst modeling new revenue sources to supplant the weakening gas tax and electrical engineers re-wiring ITS equipment. (NCHRP Synthesis 323)

Changes needed in Human Resource Practices

Part of the motivation for this proposal is the project teams' view that education and training are different elements of a workforce and curriculum development plan. The team sees education as the formation of a broad based expertise in a given academic field and training as ongoing initiatives to keep education current and to apply practical field solutions to academic concepts.

The five categories of training needed for the future of state DOTs identified in NCHRP Project 20-24(50) *In-Service Training Needs for State DOT's* are skills that are transferable from other industries:

1. Project/Program Management
2. Public/Stakeholder Relations
3. Leadership
4. Ethics
5. Global Issues

The four programs contained in this proposal will uncover new tools for attracting and retaining workers from other industries to meet these needs. In order to attract new employees, Transportation agencies will need to change the way they recruit.

NCHRP Synthesis 323, *Recruiting and Retaining Individuals in State Transportation Agencies*, found that the following factors provide insight into the reasons why individuals who have left state employment return:

1. Work Hours
2. Benefits
3. Family
4. Job Security
5. Stability
6. Liked state employment better
7. Location
8. Lifestyle

What is striking is how these issues mesh with the themes that pre-retirees reported in a recent AARP study.

Maintenance needs in transportation

The highest vacancy rate for all job classifications in state DOTs is maintenance workers (VTrans). In Vermont maintenance workers are the 2nd most prevalent job classification in all of state government (Vermont Department of Personnel), have one of the higher turnover rates and an older than average workforce.

There is a constant demand for maintenance workers. This job classification also consistently has the highest vacancy level of all sectors within state DOTs. In Vermont over 30% of the maintenance workers are eligible for retirement (VTrans).

This particular sector of transportation workers is especially difficult to attract and retain in the more urban areas. For instance in Vermont the highest vacancy rate for maintenance workers is in the area that abuts Albany, NY. In Maine, the highest vacancy rate is in Southern Maine and in New Hampshire it is in the area that borders the Boston metro region. During the three state conference calls preparing for this proposal, all three states repeated returned to maintenance workers as a large and on-going problem.

WORKPLAN

This section outlines the details of the four proposed program activities. Although the timeline for each program differs somewhat, our overall four year time line consists in general of one year of data gathering and program design, one year to pilot the curriculum and two years of follow-up, assessment, evaluation and finally dissemination.

Transportation Systems Institute

The Transportation Systems Institute is considered to be within Area 4 of the RFP where the intent is to provide for that coordination and collaboration between and among the education/training and transportation organizations within a state and/or region.

Led by the Technology Extension Division (TED) of Vermont Technical College (VTC) the Transportation Systems Institute will address both attracting new talent and retaining current expertise within the DOTs. Retention of the existing knowledge and the transfer of skills of experienced transportation workers will be accomplished in part by using experienced workers as mentors, teachers, facilitators and program developers within this program. We will be using existing state DOT expertise and awareness of the complex system issues in transportation to attract new workers. A focus of the programs offered will be on sustainable transportation and other topics that can be used as a hook to attract new workers into the transportation industry. Activities will not be traditional credit college courses but rather job rotation programs, roundtables and other hands-on activities led by DOT workers or recent retirees as mentors.

In addition to new employees, this Institute will focus on current employees and how they can be activated to meet the organizational needs of the DOT's in future years and to attract new employees. Existing DOT employees, with their vast stores of knowledge, will be trained as mentors and instructors. Using experienced staff we would establish a mentor network to create the opportunity for individuals to apply their mentoring across state boundaries. This is especially important for smaller states or geographically large states with low population and thus relatively small DOTs .

The top needs identified through this process will be included in non-credit short duration workshops and symposium. These courses would be offered by the VTC Technology Extension Division (TED) or the University of Vermont Transportation Center (UTC) depending on the nature of the course. UTC and TED will work to identify and develop at least 1 partner institution in each state through the grant period.

This model is unique because the educational institutions are placed in a supporting role to state transportation agencies. We will be providing a flexible program, not traditional curriculum, and a more comprehensive experience. These courses would be offered both at central locations as well as electronically. TED has demonstrated experience and success with their on-line partners; Education to Go (ed2go) and Gatlin Education Services (GES) to provide a comprehensive selection of interactive, web-based instruction. GES is the world's largest provider of asynchronous web based training for colleges and universities.

Because VTC is part of the same state college system they can ensure that development and delivery of the curriculum is coordinated and continuous. The strengths and weaknesses of this network will be addressed as part of the project. The final product will stress the need to develop a non-traditional curriculum based on practical applications. This could involve training assignments in other small DOT's to address upcoming projects, short courses that yield practical applications, movement of mid-career employees into DOT's, having a plan that will sustain the DOT's and the transportation industry, and related issues. We believe that the comprehensive, vertically aligned and innovative partners provide this proposal with a high level of success in meeting the proposals needs.

Assessment and Evaluation

An independent education evaluator from the University of Vermont will review the courses based on metrics and criteria established by the advisory committee. The programs will be piloted in year 2 of the project and evaluated within Northern New England pilot states before broader national dissemination. These metrics could include retention rates, attrition rates, and job satisfaction surveys. It is this evaluation that will serve to show the effectiveness of these courses in meeting the program's objectives. However, assessment might also consist of less traditional tracking such as repeated follow-up with program participants. While these methods provide smaller qualitative databases with fewer statistical measures, the detailed comments of participants as they have moved forward may be most useful to program improvement.

Deliverables

The draft and final report will include the following components related to this program:

- Specific examples and strategies which proved successful for the coordination, communication, and collaboration among education and training community organizations and key organizations and programs in the transportation community as well as directions to develop and sustain partnering efforts to address transportation workforce development.
- Identification of potential partner organizations for expansion of this program nationally including the role of each, the scope of the effort, the goal of the activity, and the intended or completed outcome.
- Identification of barriers to developing the effort on a nation-wide basis including an assessment of problems encountered during the pilot program and how to make improvements

- A list of potential major milestones necessary to implementing a program such as the Transportation Systems Institute including the appropriate geographic scope for each program

Transportation and Community Colleges Summit (Area 3)

Prior to hosting the National Summit for representatives from community colleges the UVM Transportation Center will design, pre-test and execute a web-based survey of Colleges to determine the potential curriculum that community colleges presently have in place, or could administer, that will prepare students for a career in transportation. College upper administrators as well as appropriate department heads will be contacted by post-card and email to solicit their participation. State DOTs will be contacted and asked to indicate particular college programs they already work with to ensure these programs are included. These tasks will be particularly difficult as programs rarely identify specifically with transportation but the programs that serve the industry are diverse: vehicle technology, environmental planning and accounting to name but a few.

The results of the survey will be tabulated and presented at the Summit to inform the facilitated discussion. All respondents of the survey will be invited to the two and one half day Summit at the University of Vermont Student Center. The strategic location on Lake Champlain between the Green and Adirondack Mountains will be leveraged along with time of year to maximize attendance. A reasonable number of travel scholarships will be offered. Approximately 200 attendees are expected. Professional facilitators will be used to allow small groups of the attendees to answer the following important questions delineated in the FHWA call for proposals:

- Identify the current and potential role of community colleges in providing for transportation workforce development.
- Identify possible transportation careers or positions that are currently or would have the potential to be served by community college courses or a degree.
- Identify the potential curriculum that community colleges presently have in place or could administer that will prepare students for a career in transportation.
- Identify and discuss the issues or barriers community colleges face in being more engaged in transportation workforce development.
- Identify and discuss strategies and processes that may be utilized to address how community colleges can better identify transportation workforce development needs.
- Discuss the role of community colleges in providing continuing education for in-service transportation professionals, how community colleges can work with the transportation industry to identify those needs, and the strategies and processes to provide for transportation professional continuing education.

The results of the Summit will be a blueprint for action for partnering with community colleges nation wide to advance transportation workforce development. The final blueprint document will be authored by the conference facilitators hired for the Summit, UVM and VTC project managers and volunteers from the community college representatives at the Summit. These volunteers will be offered an honorarium.

Second Careers in Transportation (Area 1)

The Second Careers in Transportation portion of this proposal is considered to be within Area 1 of the RFP where the intent to determine how the various interests, activities and programs across the transportation community can be linked together in a National Strategy to provide

a framework to meet the needs of the transportation workforce now and for the future. In this program we target one national source of workers, retirees, and a nationally present partner, AARP.

The goal of the Second Careers in Transportation program will be to attract older workers, usually retirees, to professional and office/public support positions within state DOTs and other employers within the transportation industry. Part of the program will include gauging the level of awareness of the transportation industry by this target audience. The targeted group will include primarily those who have recently retired from other industries yet possess skills needed in the transportation industry such as financial management, environmental management or citizen engagement.

In partnership with AARP Vermont, the project team will develop and implement a replicable model for agencies to identify their workforce development and planning needs and create systems to meet those needs. The AARP is a strong partner for the workforce development efforts for several reasons: they are a strong and growing group with very large national membership and therefore success in this pilot program could be expanded to all other states.

The program will be designed and managed by an external advisory committee that will include representatives from FHWA, state DOTs, state Human Resources offices, and industry, as well as representatives from Vermont AARP and the University of Vermont. The integral role of the advisory committee will be four-fold: to design the individual program components including selection of topics; to identify the specific target audiences; to advise on the vehicles for information delivery (i.e web versus printed material); and, to establish the criteria for success.

Awareness is a key element in creating new pathways into the transportation industry. This program will market the new skills needed in transportation industry to link to those retiring in other industries and showing the transferability of skills and the ability to affect change in a small state DOT. The importance of transportation in the sense that local, regional and global transportation systems are vital to community, the economy, and economic development is expected to be particularly meaningful to these target groups. These groups will recognize that transportation policies impact the environment, energy, culture, equitable mobility between regions and groups, as well as overall quality of life. Using Vermont AARP's vast network we will survey older workers to better understand their needs, what they know about the transportation industry and what it would take to bring them into the industry.

The program will also identify and promote changes in HR practices to meet the needs of older workers. The project team may partner with unions to help make this happen.

Assessment and Evaluation

Because the approaches used in this program including the web, brochures and seminars we will reach such a large audience, it will be difficult to track all participants and to evaluate if individuals consider second careers in transportation or perhaps are successful in obtaining a position. Using focus groups of recently retired Vermonters (50% who have just moved to Vermont, and 50% who have been here during their careers) we will evaluate the different means of dissemination – web, brochures and seminars – to determine which is the most effective. This program will only be piloted in Vermont where the small population and industry can allow us to track individual within the network and to perform our evaluation by using a case study or ethnography-based approach to telling “success

stories”. While termed success stories, we expect these assessments will also contain concrete examples of ways to improve the program as well as some pitfalls or problem that were encountered either by the individual of the agency they worked for. Metrics will be developed with input from the Advisory Committee to determine the effectiveness of the program.

Deliverables

The draft and final report for this project will include the following components related to the Second Career in Transportation Program:

- Identification of key education/training/professional development organizations beyond Vermont and AARP that provide education and training to attract retirees to key transportation positions.
- Evaluation of how this program can build on the current programs of the FHWA Professional Capacity Building Groups (safety, planning, environment, operations, freight, etc.), the National Highway Institute, the Local Technical Assistance Program, the Transportation Curriculum Coordination Council (TCCC), National Cooperative Highway Research Program (NCHRP) studies, the work of transportation and engineering professional organizations, state departments of transportation, and other workforce and professional capacity building initiatives to assure a comprehensive National Strategy for Curriculum Development .
- Identification of gaps in the education/training/professional development education and training as related to attracting older persons and make recommendations on how the shortcomings can be addressed.
- Description of the role for transportation community organizations in effectively linking the talents of these second careers in transportation to the next generation of transportation workers
- An action plan for ensuring a National Strategy for Curriculum Development includes older recruits as one end of the “pipeline” that feeds workforce development in the transportation sector.

Transportation Systems Academy: (Area 1)

The Transportation Systems Academy is considered to be within Area 1 where the intent is to determine how the various interests, activities and programs across the transportation community can be linked together in a National Strategy to provide a framework to meet the needs of the transportation workforce now and for the future. The Academy workforce issue of operations and maintenance workers is nationwide although more pronounced in some regions. The large target group of technical high schools and Corrections is available throughout the nation.

The Transportation Systems Academy will provide a unique partnership between state DOT’s, technical high schools and potentially the state Department of Corrections (DOCs). Just like with older workers training and awareness are key elements in creating new pathways into the transportation industry. Working with the DOC, as well as the technical high schools, in the three northern New England states this Academy will work to provide and evaluate pilot curriculum to attract those under the supervision and control of the DOC to work in the transportation industry. The project team will develop a flexible program, not traditional curriculum, which will include more comprehensive hands on experience and non-credit short duration workshops. These courses, both new and existing would be offered by the two state LTAPs partnering in this

program. In 2006 LTAP's delivered 4,978 training sessions nationally. These sessions involved over 136,000 participants for a total of over 900,000 participant hours. The advisory committee will evaluate what courses we expect to offer including leveraging the existing LTAP curriculum – what LTAP courses can be used and what new ones will need to be developed. As illustrated in Figure 6 there are a number of existing LTAP workshops that could be used in this initiative.

Figure 6

Existing Vermont Local Roads (LTAP) workshop	Strong Match for Transportation Systems Academy	Possible Match for Transportation Systems Academy	Unlikely Match for Transportation Systems Academy
All Together Now: Establishing Goals and Objectives	X		
Presentations Without Panic	X		
Who Needs an Employee Handbook Anyway?	X		
Managing a Small Highway Department		X	
Developing a Culture of Safety		X	
Now Hear This: Listen! Understand! Communicate!	X		
Municipal Policies, Standards and Ordinances		X	
Basic Welding			X
Vermont Road Law	X		

Assessment and Evaluation

The evaluation metrics for this program will be developed by the Advisory Committee and be guided by the strong assessment tools already in place in most LTAPs to evaluate courses and instructors. While we will include traditional before and after course assessment, we believe tracking of those who complete courses and their job selection will provide additional insight. This program will touch a large enough audience that state-by-state job vacancy rates may be used and this will be assessed during the curriculum development in Vermont and New Hampshire. Potentially DOC metrics that have not traditionally been used in transportation can be applied in this program.

Deliverables

The draft and final reports will include the following products related to the Transportation Systems Academy:

- Identification and evaluation of the key education/training/professional development organizations that can provide transportation education and training for student in technical high school and Corrections.

- Evaluation of how these program could build on the current programs of the FHWA Professional Capacity Building Groups (safety, planning, environment, operations, freight, etc.), the National Highway Institute, the Local Technical Assistance Program, the Transportation Curriculum Coordination Council (TCCC), National Cooperative Highway Research Program (NCHRP) studies, the work of transportation and engineering professional organizations, state departments of transportation, and other workforce and professional capacity building initiatives to assure a comprehensive National Strategy for Curriculum Development .
- Identification of gaps in the curriculum piloted and recommendations on how the shortcomings can be addressed.

TIMELINE

NATIONAL DISSEMINATION

The UTC will bring the model to the national UTC, LTAP, community college, AARP, and Correctional industry networks for dissemination and replication during the grant period. We will use a number of dissemination tools including a dedicated program website, presentations at conferences and journal papers. We will organize a panel session at the TRB annual meeting to report back on the Summit including the most dynamic Community College participants from the Summit to present. The panel would be moderated by one of the primary investigators. The results from the Transportation Systems Institute, the 2nd Careers in Transportation and the Transportation Systems Academy are considered more appropriate for regular TRB paper submission. We will seek invitations to the national AASHTO, LTAP, AARP and the National Institute for Corrections meetings to present the results of our programs.

SUMMARY:

State DOTs are on the front line of maintaining the transportation system on which we all depend. The transportation industry is a major economic sector. Keeping this sector vibrant is critical to the US economy and our quality of life. As the NCHRP Project 20-24(50) In-Service Training Needs for State DOTs states in its conclusion;

“Such partnerships could include curriculum development, instructors from throughout industry, joint-certification programs, tuition reimbursement, education/work collaboration programs, and others. **Ultimately, these partnerships have the potential to leverage the scarce resources of many organizations towards a common benefit for all.**”

This proposal brings new parties to the table for the types of partnerships envisioned. This proposal is unique because:

- 1) The diverse partnerships created including AARP, Corrections, Community Colleges and UTCs,
- 2) The vertical integration of the programs, and
- 3) The ability to recruit non-traditional workers to both professional and non-professional positions.

The support role of the academic partners is key to success of this proposal. In place of independently developing and directing the DOT’s workforce plan and curriculum, this work will place academic partners under the guidance of the advisory committees, especially the three state executive advisory committee. Furthermore, those transportation professionals will be the teachers, mentors and designers of both the curriculums and the assessments of those curriculums. This integrated partnership is the strength of our proposal.

Appendix B – 2011 Transportation Review Board paper

Assessment of Two Transportation Education Development Pilot Program Projects:
Incumbent State DOT Worker Succession Planning in Vermont New Hampshire and
Maine and Recruiting Within a Nontraditional Labor Pool at Northern State
Correctional Facility in Vermont

Available at <http://www.uvm.edu/~transctr/pdf/2011TRB Paper.pdf>

Appendix C – Transportation Systems Institute Needs Assessment

Available at [http://www.uvm.edu/~transctr/pdf/TSI Needs Assessment.pdf](http://www.uvm.edu/~transctr/pdf/TSI_Needs_Assessment.pdf)

Vermont, Maine, New Hampshire Departments of Transportation Needs Assessment

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As part of the Transportation Systems Institute component of the Transportation Education Development Pilot Program (TEDPP), Vermont Technical College Technology Extension Division (TED) and the Vermont, New Hampshire and Maine Departments of Transportation determined that a –Needs Assessment|| should be conducted in their states. This assessment was conducted in the form of several structured interviews with participants from each state. The interviews were based on questions prepared by TED and each state project representative and designed to elicit participant opinions on:

- Training,
- Knowledge Transfer,
- Job Rotation and
- Recruitment.

A consultant was retained to conduct the needs assessment interviews and prepare an analysis and recommendations based upon those interviews. Before beginning the interview process, two –test|| interviews were conducted in New Hampshire. Based on these test interviews the project team felt the questions were appropriate but that questions pertaining to Project Management should be added.

A total of 41 interviews were conducted using the modified questionnaire: 14 in Vermont, 15 in Maine and 12 in New Hampshire. Interview participants were selected by each state project team member and represented a cross section of managers and professionals at each DOT. Interviews were private and conducted in a relaxed and informal manner; each lasting about 55 minutes.

Appendix D – Transportation Systems Institute Curriculum

Transportations Systems Institute

Course list and supporting materials

1. Leadership Styles & Workplace Principles
 - Supporting curriculum:
 - i. Working with people article
 - ii. Working with people booklet
 - iii. Working with people prs

2. Systems & Organizational Change
 - Supporting curriculum:
 - i. Changing minds article
 - ii. Systems and change booklet
 - iii. Systems and change prs
 - iv. Systems and change lean solutions article

3. Coaching & Feedback
 - Supporting curriculum:
 - i. Coaching and feedback booklet
 - ii. Coaching and feedback prs
 - iii. Traffic light worksheet

4. Conflict Management & Problem-Solving
 - Supporting curriculum:
 - i. Conflict management and solving problems booklet
 - ii. Conflict management and solving problems prs
 - iii. Crucial confrontations article
 - iv. The joy of conflict resolution

5. Managing & Optimizing Group Processing
 - Supporting curriculum:
 - i. Groups and teams booklet
 - ii. Groups and teams prs
 - iii. Value judgment exercise

6. You Can't Do it Alone
 - Supporting curriculum:
 - i. You can't do it alone booklet
 - ii. You can't do it alone prs

7. Adult Learners, Mentoring, Meetings and Train the Trainer
 - Supporting curriculum:
 - i. Adult learning meetings booklet
 - ii. Adult learning meetings culture mentoring hand out
 - iii. Adult learning meetings culture mentoring prs

8. Having Difficult Conversations
 - Supporting curriculum:
 - i. Having difficult conversations booklet
 - ii. Having difficult conversations prs
9. Public & Government Relations
 - Supporting curriculum:
 - i. PR and Communication prs (Contact Jay Paterson)
10. Government & Project Finance
 - Supporting curriculum:
 - i. (Contact Jay Paterson)
11. Critical Thinking
 - Supporting curriculum:
 - i. Critical thinking booklet
 - ii. Critical thinking prs
12. Attitude, Motivation & Customer Services Skills
 - Supporting curriculum:
 - i. Communication management in the public sector
 - ii. Customer service - Transportation 2010 - All Materials
13. Technical Project Management
 - Supporting curriculum:
 - i. (contact Allan Rogers)
14. Ageism
 - Supporting curriculum:
 - i. Ageism prs

Appendix E – Transportation Systems Academy Curriculum

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The Transportation Systems Academy

The basic TSA certificate can be a stand-alone program or offered in conjunction with another certificate or degree program (e.g., high school diesel technology, automotive technology).

While each Center may build its own version of the Academy based on its strengths and capacities there are 12 basic components to the program. Numbers 1-10 are required to be incorporated in some form, and it is highly preferred to have either or both component 11 and 12 to provide a level of familiarity and experience with the industry, especially with participants who are new to the workforce. Systems can be introduced for more mature or experienced workers to translate experience or prior leaning to equate to any of the components. The program will need to have a consistent and established system to do this. The units below are based on pilot programs initiated in 2010-2011 with the Community High School of Vermont and Canaan High School. They can be adapted with new titles, combined in different units, or delivered in a different manner, but the basic competencies have to be met in any new program.

Course	Description	Syllabus	Hours*
1. Transportation 101	Overview of the transportation industry, operations, modes, careers, jobs, skills applied.	UVM TRC Can be taught by in house staff, regional planning staff, VTrans UVM TRC Career Pathway Docs	3-6 hrs (can include exercises and field trip)
2. Basics of a good road	This course teaches the basics of road rules, regulations, processes and care of maintaining good roads.	VT Local Roads / VTrans	5 hrs.
3. Winter Roads	History and overview of winter road maintenance and gives basic information on what is involved in proper winter road maintenance and management.	VT Local Roads /VTrans	5 hrs

Course	Description	Syllabus	Hours*
4. Worker Safety basics			
4a. First Aid/CPR	<i>American Heart Association Heartsaver course or Red Cross First Aid /CPR</i> Leads to certificate	Need certified instructor	6-8 hrs
	http://www.heart.org/HEARTORG/CPRAndECC/WorkplaceTraining/HeartsaverCourses/Heartsaver-Courses_UCM_001295_SubHomePage.jsp http://www.redcross.org/take-a-class/program-highlights/cpr-first-aid		
4b. OSHA 10-construction / garage	Leads to a broad awareness in recognizing and preventing hazards. Covers a variety of safety and health topics, which a worker may encounter. The training emphasizes hazard identification, avoidance, control and prevention. Leads to OSHA-10 Certificate	Need certified instructor	10 hrs
4c. Workzone/ flagging	This course presents the basic guidelines and regulations for temporary traffic control, installation, maintenance and removal. Can lead to ATSSA certificate.	Need certified instructor http://www.atssa.com/TrainingCertification.aspx	8 hrs
5. Respectful work environment	This course provides information and discussion on the guidelines and laws around creating healthy workplaces and gives specific examples of how to maintain this environment. Importance of understanding workplace expectations; Definition of unlawful workplace harassment; Examples of harassing behavior; Harassment by non-employees; Why victims don't speak out... Fears; Same-sex harassment ; Employer responsibilities & policies; Employee responsibilities		4 hrs
7. Project Planning	This course provides a general understanding of the basics in Project Planning by detailing the tools and formats used in successful projects. Review of basic road design/layout; Defining the project; Measuring options and equipment ; Calculating quantities and cost; Measuring distances; Instruction operation – hand/laser level and rod; Definitions for leveling; Using grade stakes; Estimating quantities ; Cost estimates; Presenting project overview ; Focus on key policies and trends; Use props for emphasis; How to gain public support	VT Local Roads and VTrans	6 hrs
8. Construction Math	Covers fundamental elements of mathematics necessary to a broad range of applications in construction. The emphasis is on basic concepts of place value, fractions, decimals, unit conversions, percents, area/perimeter/volume, geometry, and the metric system that are useful in measuring and quantitative problem solving in construction trades.	Determine what is available at center. How to assess competencies of participants and design course to fit needs.	38 hrs
9. Job search: research, resume, interviewing	Basic skills in crafting a resume, writing a cover letter, conducting a job search, navigating the state HR web site, basics of interviewing. Thinking about a career as well as getting a job	UVM TRC Career Pathway Docs	4 hrs

Course	Description	Syllabus	Hours*
10. CDL Basics	<p>This course gives students a basic understanding of the Commercial Driving License (CDL) requirements and reviews the CDL manual so that they are better prepared to take their written CDL test and will have a basic understanding of the requirements involved.</p> <p>Understand Commercial driver responsibilities (License Types, vehicle types, and endorsements; General Safety concerns; Transport and Cargo considerations); the CDL application; Understand the Vermont and Federal CDL Rules/Regulations; Understand the basics of pre-trip inspection Can add the use of a CDL Simulator. There is a mobile unit at the Police Academy in Proctor.</p>		20+ hrs
11. Job Shadowing	VTrans or DPW garage and/or construction site.		8-16hrs
12. Internship	Regular engagement at an employer site for a prolonged period with a mentor.		40-80 hrs

Appendix F – Transportation Systems Academy Case Study



TRANSPORTATION RESEARCH CENTER

Community High School Vermont

The Transportation Systems Academy: Partnerships building the next generation of transportation workers, one student at a time
A Case Study with the

Seeking to prepare a new generation of qualified and motivated workers to fill operations and maintenance positions in the public and private sectors the UVM TRC developed the Transportation Systems Academy (TSA). The TSA provides a sound introduction to the field and specific training and certifications necessary to obtain entry level positions as the first step on a career pathway in transportation. Partnering with the Community High School of Vermont, serving the Vermont Corrections community, as well as the Vermont Agency of Transportation, the program built a specific bridge to prepare individuals under the supervision of Corrections to be able to transition to jobs in the transportation field.



The Community High School of Vermont (CHSVT) is a unique institution, operating within the state's Corrections Department [<http://doc.vermont.gov/programs/educational-programs>] and is accredited by the New England Association of Schools and Colleges as an Independent High School that awards credits and high school diplomas. It has campuses in every state correctional facility and most probation and parole sites across the state. Research has continued to support its educational and workforce development efforts showing significant improvements for graduates in recidivism rates and the ability to secure and retain employment.

The CHSVT Workforce Development Partnership was designed by faculty and staff, with input from offenders, to teach fundamental life skills using a unique, holistic approach that immerses participants in educational, work, and living unit settings that use a strength-based approach supporting offender development. This strength-based approach is built on the understanding and use of 16 aspects of behavioral intelligence, or life skills that increase the participants' ability to effectively solve problems. These [16 Habits of Mind](#) are detailed in a series of four books edited by Arthur L. Costa and Bena Kallick. The Habits of Mind were used to

create a [curriculum for CHSVT students](#), as well as training materials in [strength-based supervision](#) for faculty and staff working with WDP participants.

The UVM TRC recognized that the CHSVT represented a diverse pool of untapped future workers who had access to a strong education and training framework. The Transportation Systems Academy (TSA) was developed through a series of pilot efforts over two year to provide a flexible curriculum that aligned directly with the industry needs to recruit a more prepared and motivated workforce. To implement the program effectively and spread it state-wide, training resources and partnerships were developed with the state Agency of Transportation, Vermont Local Roads (LTAP) and private companies. Work is being continued to gain recognition for the TSA as a valid and easily identifiable credential that will be valued throughout the industry.

The Transportation Systems Academy is continuing its second phase of development to take the work done by the CHSVT and deploy it across their campuses as well as into the state's network of Career and Technical Centers to reach an even wider range of high school age students. In this venue, through adult education programs, it can also be designed to specifically address the opportunity to reach out to more mature dislocated workers, and provide a bridge for Veterans to more easily gain recognized credentials and identify career pathways in the transportation sector.



What is the Transportation Systems Academy?

Overview: The Transportation Systems Academy (TSA) is a multi-tiered workforce development pilot program that is geared at working with non-traditional labor pools to provide career awareness and skills training for the transportation industry. The TSA is a comprehensive program that specifically trains individuals in the basics of transportation careers with an emphasis on operations and maintenance career pathways starting with a solid foundation in transportation system fundamentals and work zone safety.

The program has created a toolkit of training modules, career pathways and career development information as well as job seeking and workplace skills that can be integrated into existing curriculum or programs, or be combined as a stand-alone program that will assist interested students gain a foundation that will prepare them to be competitive in the job marketplace for positions in transportation operations and maintenance as the first step on a career path. Pathway tools demonstrate connections to jobs in multiple transportation modes. Modules include:

- Transportation 101
- Basics of a Good Road
- Winter Roads
- Worker Safety
 - ✓ First Aid/CPR (Certification)
 - ✓ OSHA-10 (Certification)
 - ✓ Work Zone/Flagging (Certification)
- Respectful Work Environments
- Citizenship and Community Participation
- Project Planning & Selling
- Construction Math
- CDL Basics
- Work Experience in a DOT garage

History: Created at the Transportation Research Center at the University of Vermont, the TSA has run pilot programs at the Community High School of Vermont and the Career Center at Canaan Vermont. This initiative was possible through a multi-year grant from the U.S. Department of Transportation TEDPP (Transportation Education Development Pilot Program) to help develop four innovative programs to attract and retain skilled workers in the transportation sector of Vermont, New Hampshire and Maine. The pilot program goal is to help educate, prepare and engage individuals not just for their next job but to start in a lifetime career path in the field of transportation.

The TSA program was designed to help address the following areas:

- 40-50 % of Vermont's transportation workforce is eligible to retire in the next 10 years.
- Fewer people are going into the key transportation fields & there is competition for those potential workers.
- The challenge of reaching non-traditional populations to create a workforce representative of our nation's diversity.
- The need for different and more complex skill sets for the next generation of transportation professionals.
- The critical shortage of maintenance and operations workers, which can be overlooked when universities focus workforce development programs on other professional positions.

- Jobs in transportation operations and maintenance are distributed widely across the state (local DPWs, state maintenance garages, private companies, nonprofit transportation services) and different modes.

Objectives: The immediate objective of the program is to support the training and career-readiness for potential *up-and-coming* employees. The longer-term objective is to attract new talent to the transportation industry from multiple pools (youth and mature workers). The program was designed in close cooperation with the Vermont Agency of Transportation (VTrans). The skill building and certification modules are closely aligned with the VTrans training requirements for all first year employees and VTrans has provided training assistance and opened up facilities for job shadowing and internships, as well as summer employment opportunities that provide excellent entry level workplace experience. The TSA is easily combined with existing education programs in construction, heavy equipment operation, or automotive maintenance.



Appendix G – Second Careers in Transportation Research

Second Careers Research & Application to Transportation Workforce Summary (TEDPP)

Michelle McCutcheon-Schour (9-29-12)

Key Search Term:

1. Bridge Employment for Older-Workers
2. Older-worker friendly policies
3. Worker Retention
4. Attracting retirees/older-workers/mature-workers

Key Research Resource

1. Encore Careers (<http://www.encore.org/>)
2. The Sloan Center on Aging and Work (<http://www.bc.edu/research/agingandwork/>)
3. AARP Research Center (<http://www.aarp.org/research/>)

1- Mature Worker Retention

1.1 Factors Related to a Person's Decision to Continue Working:

- According to (Wang, Zhan, & Liu, 2008) factors that influence a person's bridge employment decisions can be categorized into four groups:
 1. **Individual attributes including age, education, health, and financial status**
 2. **Job-related psychological variables including work stress and job satisfaction.**
 3. **Family-related variables such as marital status and quality**
 4. **Retirement planning**
- An (AARP & SHRM, 2012) survey found that 78% of workers ages 50+ said that "financial reasons such as the need for money or health insurance" represented their primary reason to continue working.

1.2 Issues related to Worker Retention:

The major issues that arose throughout literature related to the retention of mature workers were – Perceived or Actual Age Discrimination, Work Satisfaction and Feelings of Appreciation, Policy and Regulatory Issues.

- **Perceived or Actual Age Discrimination**
 - According to AARP (GS Strategy Group, 2012) "Over one-third of older American voters report that they, or someone they know, has experienced age discrimination in the workplace"
 - Employers can sometimes have a negative view of their older employees because:
- **Policy and Regulatory Issues**
 - Social Security Payroll Taxes-
 - For workers that have worked more than 35 years, an additional year of work will raise future SS benefits "only if their current earning exceeds adjusted earnings in the lease

remunerative of the top 35 years already used in the computation.’ (Eyster, Johnson, & Toder, 2008, p. 4)

- Pension plans –
 - Workers in DB pension programs will lose pension wealth if they continue working beyond their plan’s normal retirement age (Eyster, Johnson, & Toder, 2008).
 - Also, federal law restricts workers from obtaining their DB pension benefits while they are still working, restricting workers’ ability to work reduced hours while accessing their pension (Eyster, Johnson, & Toder, 2008).
- Retiree health benefits-
 - Prior to Medicare eligibility, retiree healthcare is much more affordable if a person acquires it before the age of 65.

1.3 State Level Action

States have the capabilities to attract mature workers as well as assist organizations in hiring mature workers. They can address pension and retirement issues through state level action. Some states, including Arizona, have developed a certificate program that designates certain businesses as mature-worker friendly (Greenya & Golin, 2008).

1.4 Key HR Policies for Mature Worker Retention

- **Survey the Workforce Regularly**
 - Regular surveys and assessments of an organization’s workforce demographics as well as workers’ satisfaction with their employment can help address many issues regarding worker retention. These assessment tools should be used to seek out:
 - Real or perceived age discrimination from both the managers and employees perspective (Kunze, Boehm, & Bruch, 2011).
 - Evaluate how employees are feeling in their positions and where they wish to go with their careers.
 - Understanding if employees (older and younger) are feeling appreciated in their positions.
 - Find areas in which employees would like extended training in.
- **Reduce Perceived or Real Age Discrimination as Much as Possible**
 - Age awareness training for managers should be held in order to promote positive views of different age groups and increase the awareness of the value of different age groups (Kunze, Boehm, & Bruch, 2011).
 - Managers should look for areas of their organization that may have age tensions.
- **Offer Old Employees New Opportunities**
 - Research has shown that some managers are hesitant to train older employees because they fear they will not receive return on their investment (Kunze, Boehm, & Bruch, 2011). However, younger

workers tend to spend shorter times at organizations than older worker and therefore, this notion is misguided (Robson, 2001). Allowing older employees to grow in their positions will increase their interest in their work, increasing their workplace satisfaction.

- **Create Alternative Career Pipelines for Mature Workers**
 - The majority of career pipelines are used to demonstrate upward mobility in a company. As a person ages, they may be less interested in upward mobility and more interested in other career factors such as flexible work factors. Organizations should look towards developing career pipelines for older workers that help develop a mature worker's position into something they would want as a bridge career.
- **Create Less Stressful and More Flexible Working Conditions for Mature Workers**
 - Designing positions that allow flexibility for employees enables them to take on positions without feeling like they are losing out on freedoms they had looked forward to in retirement (Eyster, Johnson, & Toder, 2008). This is especially true for workers who do not need to continue to work for financial reasons but rather do so because they wish to have a purpose.
 - **Part time hours**
 - **Alternative work schedules such as flextime.**
 - **Job sharing positions**
 - **Options for telework arrangements.**
 - **Seasonal work programs.**
- **Insure all employees have access to training to further their careers**
 - Research has indicated that it is important to provide training to older workers to insure that they can keep up with new technologies as well as feel like they are growing in their careers. However, research has also shown that promoting this type of training as specifically for senior workers is neither attractive nor effective. Providing training specifically for mature workers can create feelings of condescendence and isolation in older workers (Robson, 2001).
- **Utilize Mature Workers in Mentoring and Training Programs**
 - Creating mentoring programs, where mature workers are teamed up with younger employees can create many positives in an organization including
 - Insuring that key skills are transferred onto new workers (Robson, 2001)
 - Connecting younger workers with older workers, reducing the chance of generational frictions.
 - Making older workers feel important and as if their skills are appreciated.

2 - Attracting Mature Workers to the Transportation Field

2.1 General Information regarding later-in-life career changes:

- Older workers who have completed college and those who did not complete high school are significantly less likely to change careers than high school graduates who did not attend college. Late-life career changes are the least likely among Hispanics, women, and those who did not complete high school (Kawachi, Lewis, & Johnson, 2009).
- (Wang, Zhan, & Liu, 2008) found that – “Retirees who were younger, had received more years of education, had better health and financial conditions, had experienced less work stress at preretirement jobs, and had thought less about retirement were more likely to engage in bridge employment in a different field than in full retirement; and retirees who had better financial conditions and had experienced less work stress and higher job satisfaction at preretirement jobs were more likely to engage in career bridge employment than in bridge employment in a different field.”
- An (AARP & SHRM, 2012) survey found that one in five employed workers are interested in leaving their current positions. The majority of mature workers say that they enjoy their new careers compared to their old ones, despite the trend that there is usually a decline in prestige, and/or social standing (Kawachi, Lewis, & Johnson, 2009).

2.2 Attracting Mature Workers in Recruitment

- Insure that Older-Workers are apart of your Recruitment Strategy
 - Seek out recruitment channels that will reach older workers, such as print advertisement and professional societies (Robson, 2001).
 - Design postings that attract older workers by discussing the position’s benefits, flexibility, stress level, etc.
- A survey by Princeton University found that many entering retirement would like to find new work that contributes to the “greater good” but many expressed they would find it difficult to find these types of positions (MetLife Foundation, 2005). Therefore, organizations should seek out recruitment channels that will reach older workers–
 - Increasingly recruitment is done via the internet, but older workers may be more apt to finding positions through print advertisement, professional societies, or advertising media with a regional or senior lifestyle focus (Robson, 2001).
- When recruiting for mature workers, organizations should keep in mind the main concerns of this workforce demonstrated in research:
 - Benefits and salary
 - Giving back to their society
 - Flexible work schedules

3 Issues of the Transportation Workforce

- Clear needs in the transportation sectors (Transportation Research Board, 2003):
 - Midlevel managers
 - Workforce skills required to keep pace with new methods and advanced technologies including:
 - Systems analysis
 - Computer- aided design and engineering
 - New materials
 - Robotics
 - Intelligent transportation technologies
 - 50% of the state transportation agency workforce will be eligible to retire in the next 10 years.
 - Planning and environmental models, systems analysis, intelligent transportation systems technologies, community involvement and alternative fuel transit vehicles.

4 Possible Areas of Research

Public Sector Older-Worker Retention

- The majority of the research available on bridge careers and mature workers is focused on the public sector. Some research has investigated the general motivations of public sector employees (please see (Delfgaauw & Dur, 2004)). However, there is little investigation into the motivations of older public sector employees and how these motivations may differ from the private sector.

Department of Transportation (DOT) Workforce Demographics and Satisfaction

- Government entities must regularly gather data on their workforce; they may not always have an understanding of all the demographics at play. The Sloan Center's evaluation of the transportation sector found that employers have limited knowledge of the demographic composition of their organization's workforce (Sweet & Pitt-Catsoupes, 2010). In addition, government entities regularly do collect data on specific skill sets, education levels, and experiences of their employees (Davidson, Lepeak, & Newman, 2007).
- It also important to investigate how older workers and newer workers are feeling in the workplace. Investigating if any specific group is feeling alienated, left out of trainings, and/or feels that there isn't room for them to grow may give insight into the future of that organization's workforce.

DOT Hiring and Recruitment Practices

- A lot of research has indicated there are ways to appeal to the older generation in recruitment. Evaluating DOT recruitment practices may help evaluate which skill sets HR personnel are recruiting for

- It would also be interesting to evaluate how the DOT has replaced recent retirees, what skills were lost and which were gain. Mainly, are HR personnel hiring on the correct skills sets?

Bridge Employment for Low-Skilled Workers

- There appears to very little on bridge employment for low-skilled workers. It is especially important that low-skilled workers are targeted for bridge employment because they are the most likely to need to continue working due to financial reasons. In addition, these workers tend to be the ones that need to switch careers later in life because they regularly participate in physical work which they can not continue doing in later life due to physical constraints (Eyster, Johnson, & Toder, 2008).

Successful Bridge Programs

EnCorps Teachers Program

The EnCorps Teachers Programs is a California state sponsored program that partners with companies to transition older employees into teaching positions. The goal of the program is to transition professionals in the fields of science, technology, engineering and math (STEM) into the role of public school teachers. EnCorps has career pathways for people with different levels of experience and for various commitment levels.

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Appendix H – Transportation Workforce Development at Community Colleges (2010)

Transportation Workforce Development at Community Colleges can be found at: http://www.uvm.edu/~transctr/trc_reports/UVM-TRC-10-002.pdf

Executive Summary

The need for proactive and coordinated workforce development in the transportation sector has intensified with the impending retirement of hundreds of thousands of workers from the Baby Boom generation, and the changing nature of the work of transportation agencies at the federal, state and local levels and in the private sector. Meeting these demands will require a comprehensive, intermodal strategy that develops a workforce that represents our nation's diversity. This new workforce will need to create and maintain a sustainable, barrier-free, socially inclusive mobility system that reflects the U.S. Department of Transportation's (U.S. DOT's) goals for safety, livable communities, economic competitiveness, environmental sustainability, and organizational excellence.

This effort has many prongs, including efforts to develop a National Transportation Workforce Development Strategy led by the Research and Innovative Technology Administration (RITA) and the Council of University Transportation Centers (CUTC). The development of the national strategy will include key national transportation and professional organizations, and is expected to result in a series of actions and recommendations for improved transportation workforce development. Key components in the effort to develop a national strategy include a series of Regional Workforce Summits hosted by University Transportation Centers and a planned National Transportation Workforce Summit being organized by RITA with CUTC and transportation partner organization support.

Community college participation and endorsement will be integral to the success of a National Transportation Workforce Development Strategy. The University of Vermont Transportation Research Center (TRC) analyzed the results of a survey conducted with the American Association of Community Colleges (AACC) that sought to quantify existing community colleges' programs, infrastructure and partnerships preparing students for careers in transportation. Building upon data from this survey, the TRC has analyzed what transportation training exists at community colleges today and how that curriculum is supported by both investments in specialized equipment and through strategic partnerships.

As detailed in the following report:

- The majority of schools reported having programs that develop skills relevant to the transportation sector, especially general skills (finance, technologies, operations and maintenance) that are transferrable to non-transportation industries.
- Where schools are planning to expand or initiate transportation curriculum, it is primarily in technical areas, such as engineering, where the skills may extend to sectors other than transportation.
- Similarly, where schools indicated having specialized equipment, most of the investment was for tools that could be leveraged beyond transportation studies. Few schools reported owning or having access to transportation-specific equipment, such as training ships, rail cars, or airplane fuselages.
- The majority of schools reported having strategic partnerships with other schools; federal, state, and municipal government entities; and private companies – supporting their transportation-related efforts.

Collectively, this data suggests that there is a solid foundation within community colleges to deliver transportation-related training, but that additional investment and coordination likely will be necessary to support future workforce needs. To that end, this report lays out both best practices for community colleges looking to increase their transportation programs and recommendations for how the U.S. DOT can best stimulate and support the evolution of community colleges as a key pillar in the transportation workforce development infrastructure.

**2013 Transportation Program Survey of New England
Community Colleges**

**University of Vermont
Transportation Research Center**

**Summary Report
July 2013**

**Carol Vallett, Ed.D.
University of Vermont
College of Education and Social Services**

Introduction

In 2009 the University of Vermont Transportation Research Center (UVM TRC) conducted a national survey of community colleges regarding transportation related courses and programs. Subsequently, in spring 2013 the UVM TRC undertook a similar but more in-depth survey of New England community colleges seeking to gauge the transportation specific programs in place and planned for the future as well as information on equipment, funding and other special considerations. The UVM TRC also sought through the survey to build a database with college specific information about transportation offerings to further enhance regional connections and build upon beginning partnerships with community colleges in Vermont and Massachusetts. This summary report provides an overview of the data collection efforts, analysis and suggestions for the future.

Methodology

A regional survey was launched in April 2013 to the 35 community colleges located in New England states. Institutions were identified via web search; e-mail and postal addresses were gathered for contacts (either president or academic dean/vice president) for each college. Community colleges contacted included those in Connecticut, Massachusetts, Maine, New Hampshire, Rhode Island and Vermont. This survey was similar to the previous national survey, however institution names and demographics (size, location) were collected as were individual contact information for those who completed the surveys. The online survey, implemented using SurveyMonkey, was also enhanced with additional questions concerning transportation mode, but yet easier to navigate for respondents due to built in survey logic that allowed for question skipping.

Data collection methods followed those outlined by Dillman (2011) specifically for internet surveys. First a letter was sent to the institutional contact via U.S. Postal Service signed by the UVM TRC Outreach Manager ([Letter to NE Community Colleges](#) Appendix A). One week later, the letter was followed up with an e-mail to the institutional contact with more information about the upcoming survey. Approximately two days later another e-mail contact was sent with information for accessing the survey. Reminders were sent to non-respondents at weekly intervals over a two-week period. Finally, after reviewing non-respondent websites online, personal e-mail contact was made by the UVM TRC Outreach Manager to the institutional contact with a final request.

As a result of these efforts, data was received from 20 of the 35 institutions for a resulting 57% response rate. Two community colleges had information submitted by several individuals in the college concerning different areas of programming. That data were merged together for one institutional record. A copy of the survey is available here as [Appendix B](#) while a list of responding institutions by state is in [Appendix C](#).

Survey Results

Curriculum

The results provide a baseline of transportation related education currently available at New England community colleges and a look at what is planned for expansion in the near future.

Colleges were asked to indicate what general transportation related programs they were currently offering or planned to initiate. Additionally, for current offerings, they were asked to indicate if the program had been added to the curriculum in the previous four years.

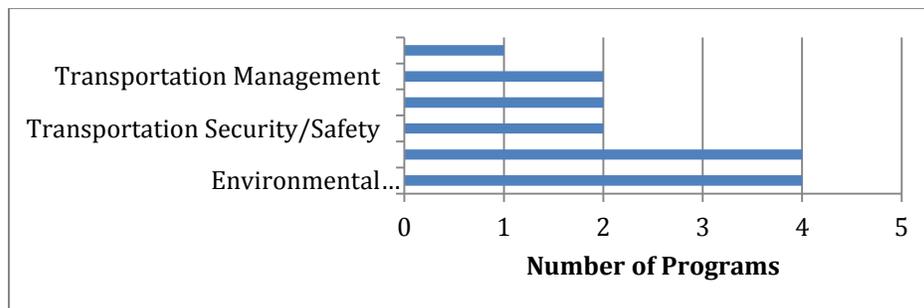


Figure 1. New England Community Colleges Current General Transportation Programs (n=11)

Figure 1 depicts the number of current program offerings from the 11 respondents to this question. All of the Transportation Management and Transportation Security programs had been developed in the previous four years. Respondents indicated that additional programs were being planned in Design Engineering (1) and Transportation Logistics (2).

Colleges were also asked about offerings in specific transportation modes. Results for current and planned offerings are in Figure 2.

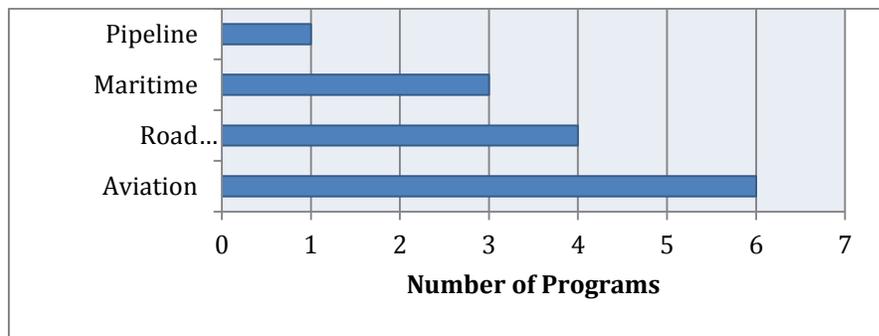


Figure 2. New England Community Colleges Current and Planned Transportation Programs by Mode (n=20)

Offerings in the field of aviation were the most frequent with four colleges currently offering programs in aviation and an additional two planning to initiate offerings in aviation. Aviation programs included programs in aviation studies, avionic technician or mechanic and planned flight school programs.

Four schools were offering programs in road construction program, with one of those programs having been added within the last four years. Three community colleges had maritime programs in place, primarily maritime or marine technology. Only one community college offered a program in pipeline related studies, specifically specialty courses for pipeline technician preparation. No institutions reported any rail related programs.

Nationally recognized programs were in place at nine of the responding community colleges. These included certified flagging programs, CDL-A & CDL-B, ASE certification and/or NATEF for automotive and heavy equipment programs as well as automobile manufacturer certifications and FAA certifications.

Facilities and Equipment

The colleges were also asked to indicate transportation related and specific facilities or equipment they owned, had access to or planned to acquire in the future. General Transportation related equipment accessed by the colleges is indicated in Figure 3.

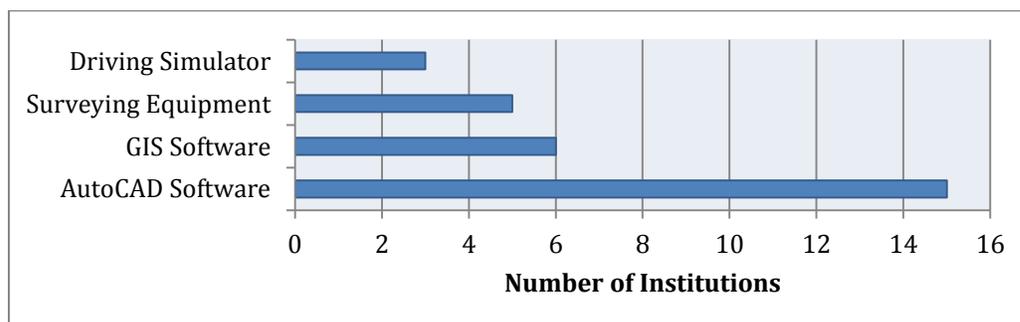


Figure 3. General Transportation Related Equipment Available at New England Community Colleges (n=15)

For aviation specific programs, several had access to commercial airplane fuselage and/or various engines for training. One other was planning to share access to a FAA Testing Site while another was planning to add composite manufacturing capability for workforce training specifically to build the next generation of airplane turbines and blades. No special facilities or equipment were mentioned for other specific transportation modes.

Other Program Characteristics

Employers

Community Colleges were asked about the employers of their transportation students. Of the 13 responding institutions, most (12) had students employed by

private employers, others by municipal (7), state (5) or federal (5) transportation agencies.

Special Program Features

When asked about special program features, most institutions mentioned the high quality of their programs and the partnerships they had or were developing. The partnerships included those between colleges for program and equipment sharing as well as those with private industry for workforce development.

Special Funding

Eight institutions mentioned that they had received dedicated funding for transportation programs. These sources included federal funds for specific workforce development programs or equipment including trainings for airport security personnel, driving simulator purchase and curricular development of a composite manufacturing program. State funds were also allocated in some locations for specific program development including aviation and transportation distribution and logistics. Other outside support also included the loan of equipment or worksites by private industry such as heavy equipment and simulators.

Summary

This survey served to provide detailed information about New England specific community college educational activities related to transportation education. Transportation related offerings at New England community colleges are both in-place and expected to grow, especially in the areas of aviation and transportation logistics. For the UVM TRC, this survey work established a useful database of information and contacts at community colleges in New England. The database and survey could be used in the future for personal contact with the responding colleges in order to track development of programs, funding needs, student enrollments and to build a regional network for community college specific transportation programs. This will be valuable as the TRC continues its efforts in transportation workforce development with a specific regional focus.

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