This toolkit is designed for educational institutions looking to establish a transportation job readiness program as part of a high school or adult education career program. It is based on the Transportation Systems Academy developed at the UVM TRC as part of the Transportation Education Development Pilot Program (TEDPP). The results are meant to guide adoption and adaptation of a TSA program. This document outlines the steps to planning and implementing a TSA while outlining the barriers and the corresponding solutions identified during the TSA pilot stage.

Steps to Planning and Implementing a Transportation Systems Academy (TSA)

The UNIVERSITY *of* VERMONT

TRANSPORTATION RESEARCH CENTER

Nationally, 40 - 50% of the current transportation workforce is expected to retire in the next decade. In Vermont, New Hampshire and Maine, a similar trend is occurring. Fewer workers are gravitating to the field and there is intense competition from other industries for qualified workers at all levels. The University of Vermont Transportation Research Center and its partners in the Transportation Education Development Pilot Project (TEDPP) have worked to identify, test and document key strategies that can meet these challenges. The Transportation Systems Academy (TSA) was one of those initiatives.

http://www.uvm.edu/~transctr/workforcedev

Introduction

The Transportation Systems Academy (TSA) is a multi-tiered workforce development pilot program. The TSA is geared at working with non-traditional labor pools to provide career awareness and skills training for career pathways in the transportation industry. It is an adaptable program that can be offered to a variety of individuals at different career levels, including high school students, adults, and second career seekers. It can also be integrated into different educational institutions and programs.

The mission of the UVM TRC's Transportation Workforce Project is to help educate, prepare and engage individuals in careers that have an impact on the everyday lives of Americans. The transportation industry provides an opportunity to help build sustainable communities and tackle issues such as climate change, energy use and safety. The Transportation Systems Academy (TSA) pilot effort focused on preparing young people for careers in surface transportation, starting with jobs in operations and maintenance. The project linked the specific needs of the state DOT maintenance workforce with the programs and capacities of high schools, career and technical centers and adult education program. The program also tested program approaches that would attract new workers from non-traditional labor pools.

As the program adopted a career pathway model it was determined that the basic structure and content of the TSA provided a sound foundation and could be easily adapted to help prepare interested participants for entry careers across multiple modes in the public and private sector. While structured initially as a stand-alone program, the TSA was later adapted to also be integrated into existing curriculum that provided key workplace skills and credentials drawn directly from the DOT competencies for first year employees.

The TSA has been successfully offered in five different setting in the state of Vermont. The hosting educational institution implemented each of these programs while the University of Vermont Transportation Research Center (TRC) provided the framework, coaching and specific services, as well as collecting data on program effectiveness. Through this, the TRC has gained a wealth of information regarding options on how to best implement a TSA program.

Participants in the TSA included high school students participating in a construction trade program; students from multiple schools in a Heavy Equipment Operators Career program; students enrolled in a high school program in a corrections facility and a group under community supervision of the corrections department; a group of mature workers; and group of New American women.

This toolkit provides information on curriculum, structure and delivery, designed for educational institutions to adopt and adapt a TSA program. This document outlines the steps to planning and implementing a TSA while outlining the barriers and the corresponding solutions identified by the TRC during the pilot period. If you have comments, insights or ideas as you use the tool kit, develop new programs or adapt it to existing programs please feel free to share them with us.

Glenn McRae (UVM TRC)
glenn.mcrae@uvm.trc

Table of Contents

A Brief History

The TSA was first implemented as one of four programs of the TRC's [Transportation Education Development Pilot Program (TEDPP)](#). The first successful TSA was held at the Northern State Correctional Facility in Newport with the [Community High School of Vermont (CHSVT)](#).   As a result of the first pilot TSA, CHSVT adopted the program into their curriculum and launched new academies at the correctional facility in St. Albans and at the Community Probation and Parole Center in Rutland. The Rutland program also featured a partnership with the Vermont based [Associates for Training and Development](#), specializing in job and career development for mature workers. This provided a dynamic intergenerational learning environment. Today, CHSVT is looking to implement a broader highway construction curriculum with national certification.

Other pilot initiatives included the Career Center at [Canaan High School](#), where the program was implemented with 18 students from Vermont and New Hampshire in 2011 and then again with 16 students in 2013. A program was developed at the [Riverbend Career and Technical Center](#) (Bradford) in concert with their [Heavy Equipment Operators](#) program for high school students. The final pilot effort was carried out in 2013 with the Adult Education Program at, [Hannaford Career Center](#) in Middlebury. This program featured an innovative partnership with the organization [Vermont Works for Women](#) which recruited and coached 7 participants through the program (5 of them were New Americans from Bhutan).

A TSA Instructor from the First TSA Cohort

TSA Students from the First TSA Cohort

INTRODUCTION TO THE TOOLKIT

The Transportation Systems Academy (TSA) is designed to be a transportation workforce and career preparation program. The TSA framework creates an opportunity for youth and current workers in other fields to consider jobs and careers in the transportation industry. The program and specific learning units help participants become conversant in the field, and learn the basic skills needed to present themselves as a job-ready applicant. While the focus in the pilot program was on highway maintenance and operations, the program can be easily modified to address any mode.

Workforce initiatives require plenty of advance work to be successful. An essential first step in planning and implementing a TSA is identifying the workforce needs of the local transportation industry and aligning it with your institution's expertise and strengths.

This toolkit will provide you with a basic outline of how to develop a TSA program including:

1. Building Employer Partners
2. Developing Program Goals
3. Bulding an Advisory Board
4. Program Coordinator and Student Advisor
5. Evaluating the Capacity of the IMplementing Institution
6. Student Selection and Recruitment
7. Curriculum Development
8. Selecting and Finding Trainers
9. From Program to Job
10. Program Follow-up

These steps are not listed chronologically because many of them will occur simultaneously. Fundamentally, the TSA framework has been developed to be a highly adaptable and evolutionary allowing the programs to grow with the changing workforce and educational needs of the transportation industry. It is likely a TSA program will not follow these steps exactly. Rather, these steps can act as a suggested road map.

SECTION 1. BUILDING EMPLOYER PARTNERSHIPS

The foundation of any TSA is its partnerships with employers. Employers can provide curriculum material, trainers, internships, and jobs for TSA students as well as advise on the program's direction.   It is important to build as many ties as possible with employers. The more buy-in an employer has the more likely they are to support the program and the students. Employer resources should be used as much as possible.

Finding Employers to Partner - A good place to start when looking for industry partners is to meet with state transportation agencies to determine where there will be the largest workforce needs (including their own) in the upcoming years. Employers facing a workforce shortage are more likely to be supportive of a TSA because they will see it as a recruitment opportunity.

Particularly, the state's Department of Transportation will have a good idea of which transportation modes may have the largest workforce needs. They should also be aware of which specific employers will be, or are facing, an aging workforce and/or a skills gap. The Local Transportation Assistance Program will be highly tuned in to the needs of municipal and county highway departments and state associations will be the best way to assess the needs of private industry.

An ideal employer will have strong interest in finding a new workforce source as well as be an employer of choice for job seekers. In most cases there would be a set of key employers that a TSA program targets (including local transportation providers, state DOTs, private companies)**.**

If a program is working with new populations, such as the TSA pilot was engaged with (Corrections, New Americans), there are other challenges in finding entry level opportunities at the state DOT level. This supports the idea of having multiple employers engaged and working with the program.

Charateristics to look for in TSA Partner

- **A significant workforce with room for individuals to advance.**

- **A need for a new workforce source.**

- **An understanding of their current and up incoming workforce needs.**

- **Interest in partnering with educational/ training institutions**

- **The willingness to invest in training and education for their employees.**

- **Offer good jobs that pay competitive wages and offer opportunities for advancement.**

TSA Students Learning to Survey

CASE: VERMONT AGENCY OF TRANSPORTATION

Since the late 1990's, the Vermont Agency of Transportation (VTrans), like their counterparts throughout the country, has been facing workforce challenges, specifically with their maintenance positions. VTrans was an original partner, supporting all facets of the TEDPP pilot effort, seeing it as an opportunity to address key issues and build new approaches to attracting and retaining the next generation of workers. This strong relationship, the clearly articulated workforce need, and complimentary assets made the state agency an ideal employer partner for the pilot phase of the TSA.

VTrans has been vital to the entire process of developing and implementing the pilot phase of the TSA. The agency has:
- Helped develop and review curriculum.
- Offered internships to TSA students Provided speakers and trainers for the TSA.
- Offered career development and awareness training for TSA students

Beyond their strong support, VTrans has been an ideal partner because they are an employer of choice for many individuals. People seek employment with VTrans because:
- They offer opportunities for professional growth.
- The agency has a generous educational reimbursement plan.
- Being a statewide agency, they offer positions in many locations.

While there was strong support for the TSA within VTrans, it has still taken several years for the program to gain traction within the agency, especially in making lines to Maintenance District personnel who could act as local resources for different programs across the state.

Outreach on many levels has been needed to make sure all those making hiring and managerial decisions are aware of the program. One of the most effective outreach efforts for educating the agency on the TSA has been attending state-wide meetings and training sessions for state personnel in Operations and Maintenance. At these gatherings TSA representatives have:
- Educated VTrans employees on the TSA and its students.
- Gathered suggestions and information to improve TSA curriculum.
- Recruited VTrans employees to be speakers and trainers for the TSA.
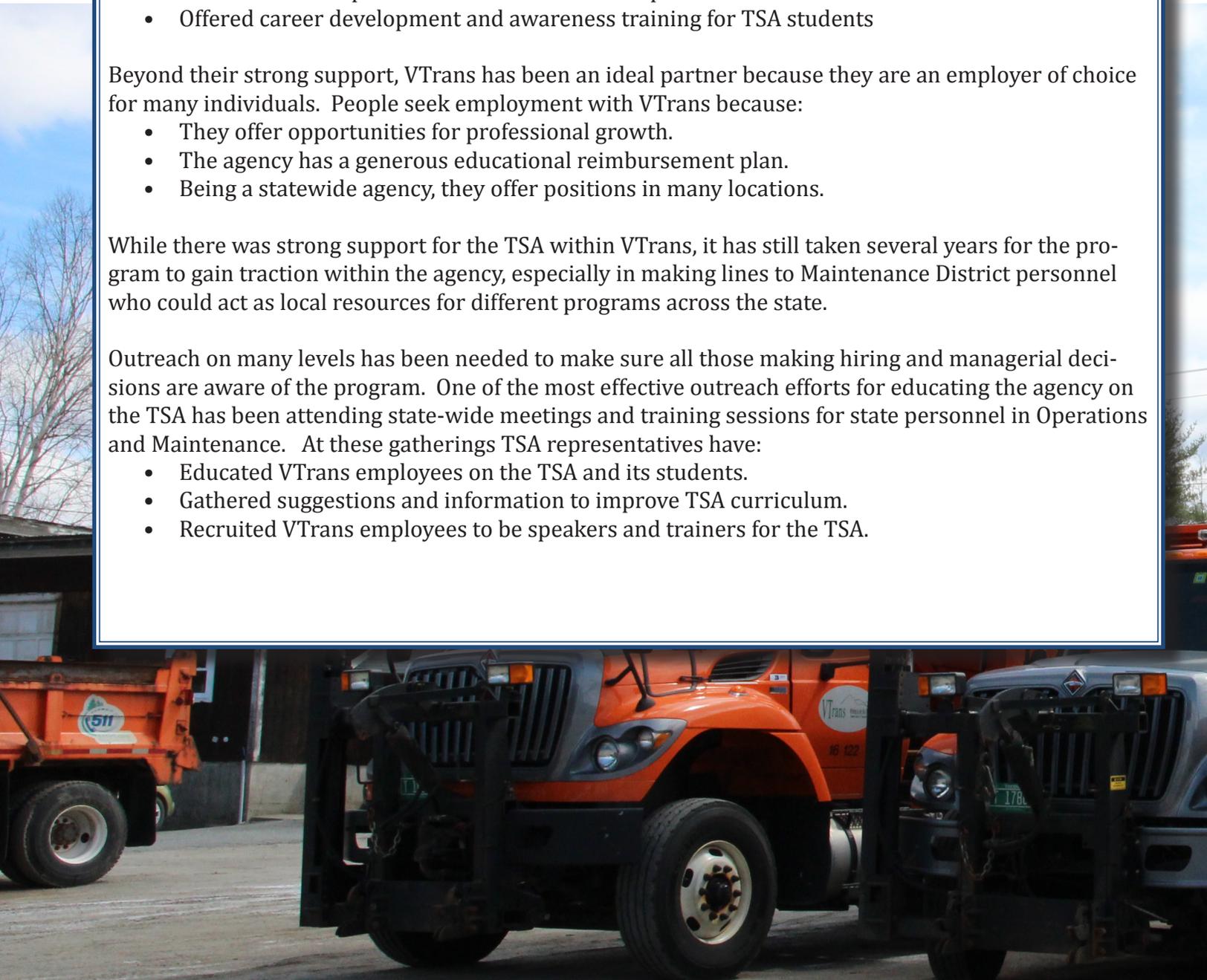
CASE: VERMONT AGENCY OF TRANSPORTATION (CONT.)

The size of VTrans has been both a strength and weakness of the agency as an employer partner. While there is a strong need for new workers in the coming years, VTrans as a state agency has standards and procedures that do not always make it easily accessible for young and interested individuals emerging from high school or career training.

Due to its size, VTrans has many facets that can be utilized for the TSA including:

• VTrans training facilities that can be used to train students as well as VTrans employees to become trainers.

• Employees available at all levels throughout the state (district garages) who can be recruited as trainers and speakers. *(Introducing workers from the field to students and program participants is one of the strongest features of the TSA program, and one of the most important in providing real context for what a future job and career might look like.)*

• A well-developed recruitment and human resource department that can help students search and apply for jobs.

Section 2. Developing Program Goals

One of the first steps in developing a TSA is determining what the program goals will be. In general, all TSA's have two fundamental goals:

- Increasing career awareness in the transportation field among new workers

- Equipping participants with key entry level skills and certifications that will make them stand out in an applicant pool

However, each TSA may have a different specific focus, especially in the pilot phase. In order to determine this focus, implementers of the TSA should determine with their industry partners:

- Which industry/mode will the program be geared towards?

- What positions within these industries would the TSA provide entry level training for?

- What type of student/participant will be recruited to the program?

- Are there other partner organizations that will add value in recruiting, training or placement?

After these questions are considered, it is helpful to develop a statement of intent. For example, the program focus for one of the Vermont pilot TSAs was to "recruit women and minorities into entry level road maintenance positions".

All of the pilot TSA programs were geared towards training and recruiting individuals for entry-level highway maintenance positions. This focus was determined through meetings with VTrans and other industry employers who expressed a workforce shortage for these positions. However, each program was focused at recruiting and training a different workforce pool including:

- Individuals under the supervision of the Corrections Department

- High school tech students

- Mature workers

- Women and minorities – adult students

For each of these groups, the programs focus was slightly different which altered the program's implementation.

CASE: CANAAN HIGH SCHOOL

Canaan High School is located in Canaan, Vermont. It is in the northeast corner of the state, near the Canadian border and in an extremely rural area. Located within the school is the Canaan Career Center's Building Construction and Restoration Carpentry. This program is a two year vocational education course that teaches skills in carpentry and building restoration and preservation. In recent years, the course has looked to diversify in order to give its students the best chance possible in finding a job and/or secondary education after graduation. The TSA was a nice fit into Canaan's program because the center already taught many of the TSA's core classes. As a result, the focus on this program became "to introduce construction students to careers in transportation careers such as road construction."
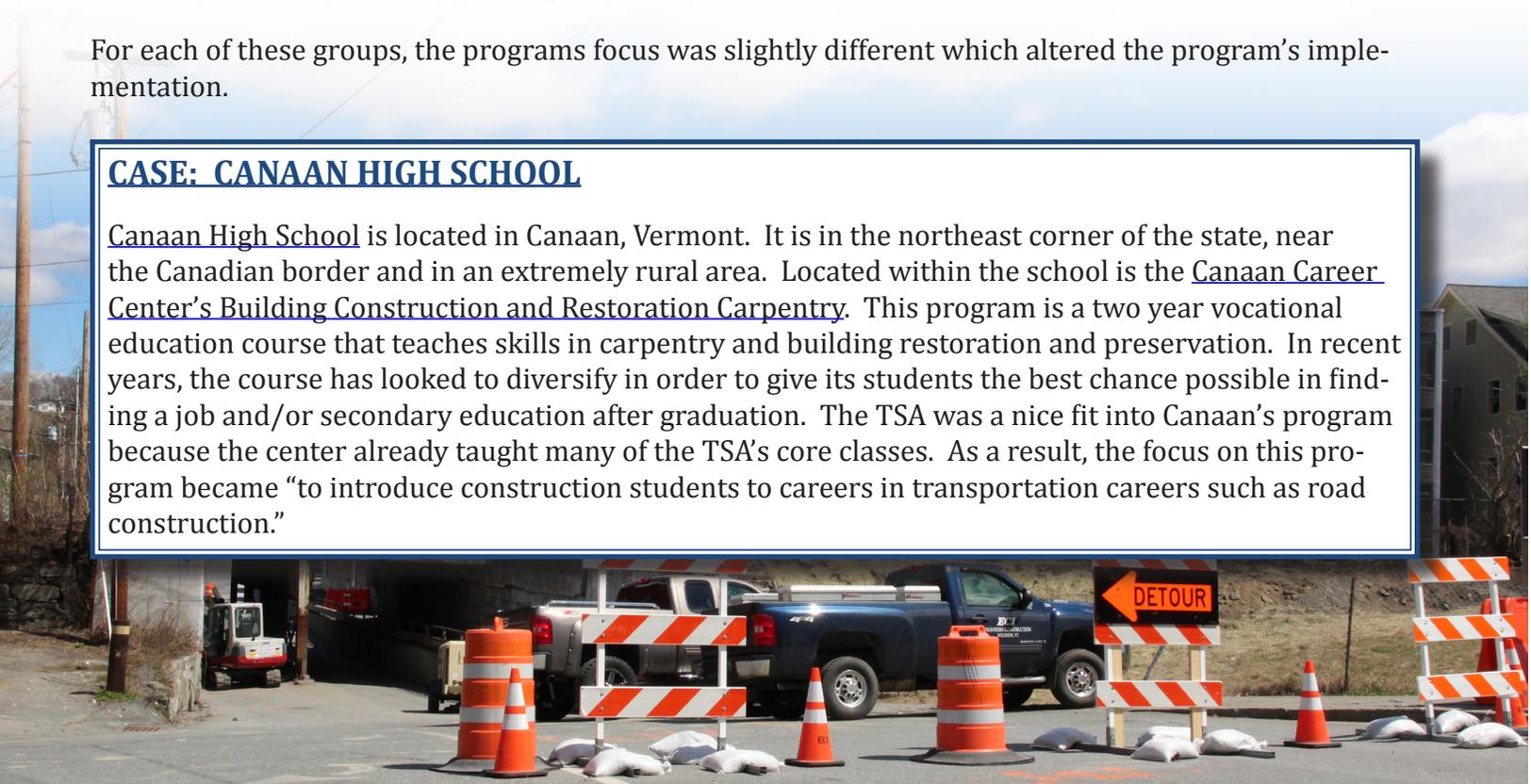
Section 3. Building an Advisory Boards

Advisory boards can be extremely helpful in the process of designing and implementing a TSA program. They can help bring many well-rounded perspectives to the program, assist in recruitment and placement and provide a "career" orientation to the program, not just a job training/placement effort.

The composition of an advisory board can include members from the following categories:

1. Educators

2. Employee partners

3. Key industry actors

4. Community leaders

5. Guidance and Career Councilors

6. Department of Labor counselors and program personnel

The advisory board should have the ability to review and give input on all aspects of the TSA, particularly in its developmental stage. This can include student selection, curriculum development, program development, and internship and job placement opportunities.

CASE: TSA ADVISORY BOARD

At one of the career centers, it is standing policy that there is an advisory board for each program. Prior to this, the TSAs had been initiated without the benefit of an advisory board. The value of an advisory board in this last case, however, was soon established and it is highly recommended as a key component of any future program initiation.

The advisory board compiled for this TSA was comprised of industry employers, educators from the school, the town road department, the state transportation agency, the regional planning and economic development commission, and the community college. The board brought new perspective to the program; enlightening the organizers on many improvements that could be made. They provided helpful information regarding the program's:

- Curriculum
- Student selection and recruitment
- Timing (when certain classes should be held)
- Internship opportunities

The advisory board met twice prior to the program's implementation.
The first advisory board meeting agenda included:
- Program goals and proposed timeline.
- Curriculum development
- Student recruitment methods and program advertisements Student assessments and class certificates Recruiting trainers and building capacity
- Developing a second phase of the TSA – what would the curriculum look like?

During the second advisory committee meeting the same topics were reviewed. However, the main focus was on student recruitment and developing a second phase of the program. Overall, the advisory board helped guide the program's curriculum development and recruitment process. With the completion of the pilot effort this advisory board will be brought back together to determine how the program can and should grow.

Section 4. Program Coordinator and Student Advisor

One or two individuals need to be assigned to act as a program coordinator and student advisor. In some cases the TSA would be offerd as an additional framework added to a specific program (e.g., Heavy Equipment Operator) at a school and the lead program instructor can fill this role, possibly with the assistance of the Guidance Counselor. It would be unusual to have one teacher teach all of the TSA classes. Rather, experts will be brought in to teach specific courses. As a result, it is important to have at least one person oversee and attend all the courses to provide continuity for the students, enable guest instructors to focus on content, and insure quality for the program. Below is the description of these two duties and their importance.

CASE STUDY

The TSA's pilot programs were initiated by the TRC and in each case the TRC staff acted as Program Coordinator in each TSA. The host school or institution provided a teacher who acted as the student advisor. These teachers were normally the teacher for whichever tech program the TSA was being run in conjunction with.

For example, at a TSA program held at a northern Vermont high school, the TSA was integrated into the existing construction skills training program. The main instructor for the construction program acted as the student advisor. This teacher was vital to the success of the program because he was able to prepare students for each class, watch for students struggling, and follow-up with students after classes.

In the TSA that targeted adult students, an advisor was hired from a non-profit that had expertise in implementing trainings for adults, in addition to the staff at the school. This was particularly important for the adult program were many students had either language barriers or lacked basic math skills, therefore extra support was needed. The student advisor attended each class, held review sessions for students outside of the program, and helped review the students' performance throughout the courses. They very quickly become integral to the student's success during the program and afterwards.

Program Coordinator – The program coordinator oversees the TSA program. They act as the key point person for the teacher and instructors. They oversee the scheduling of the courses and insure that all the classes have the resources they need. If this individual is not going to attend all the courses, they should at least be present at the start of each class to make sure everything is carried out smoothly.

Student Advisor - While there are many upsides to having experts teach each course, it can cause some difficulties for students, especially if they have follow-up questions or if instructors make conflicting points. Therefore, it is important to have one individual attend all the classes. This person observes each student and watches for any student who may be struggling with the curriculum or with the program in general. They also act as a resource for students after the classes are completed for job and application questions.

TSA Students Practicing Construction Math
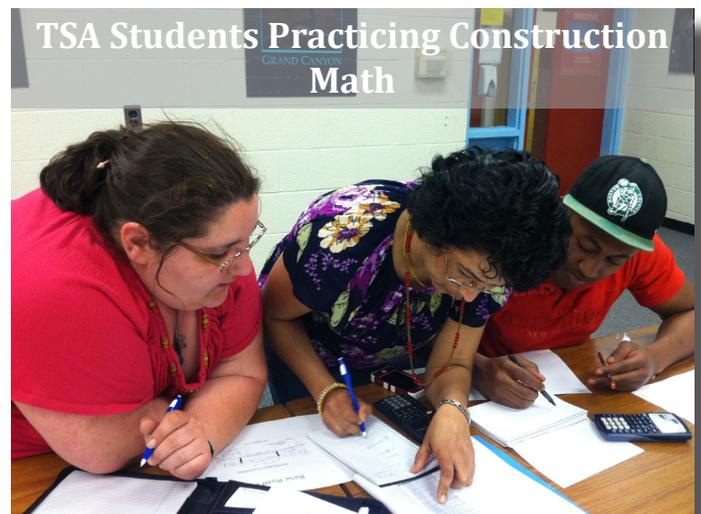
SECTION 5. EVALUATING THE CAPACITY OF THE IMPLEMENTING INSTITUTION

The implementing institution of the TSA will most likely be an educational facility such as a career center, high school, or community college. It is important to know:

1. What type of instructional and practice facilities does the institution have?

2. What is the capacity of the institution to develop clear guidelines and program parameter for a pilot/new effort?

3. Which type of students is the institution prepared to handle:

   a. Adults or high school students?

   b. Individuals with limited reading capabilities?

   c. Non-native English speakers?

4. What type of resources does the institutions have that could be utilized for the TSA?

   a. Technologies?

   b. Equipment?

   c. Computer learning labs?

   d. Trainers?

CASE: RESOURCING THE TSA

In the spring of 2013, the TSA was held at three career and technical centers in different locations in Vermont. Each of these centers has various resources and expertise to offer the program. Prior to starting the program it was important to know which courses the institution had the capacity to teach internally. For example, all three centers already taught OSHA 10, First Aid, and CPR. Therefore these courses, already in the schools' curriculum, did not need to be developed or specially scheduled for the TSA students.

Another course, Introduction to CDL, required a number of new resources – a certified CDL instructor to teach, a simulator and truck for students to practice on, as well as a large parking lot and/or private road for students to practice in. A less complicated course, Transportation 101, only required a room, wireless Internet to play videos, and a projector. It was assumed that all of the centers would be able to provide the resources for this class with no issue. However, one of the centers had *youtube.com* locked as it was deemed inappropriate for students to use at school. As a result, when the instructor attempted to play videos vital to the class, they could not and a tech specialist needed to be called in.

In addition to instructional, physical and technological resources the ability of a program to properly plan and set up clear structures to guide the program is important. The Community High School of Vermont, based as it was in the Corrections Department, has a strong culture related to assessing, planning and organizing new programs for its diverse student body and multiple types of locations. As a result of their first TSA pilot, they developed a clear set of program processes and guidelines for future efforts (see Appendix B).

Section 6. Student Selection and Recruitment

The success of a TSA is as much dependent on the student/participants as it is on the instructional faculty, the facilities, and the overall organization. The TSA pilot looked at three models to recruit students:

1. Post an offering through the institution to any interested student who could add it to their schedule.
2. Integrate it into an existing curriculum / program and require that all enrolled students participate.
3. Advertise it as a general job/career training opportunity throughout the community.

Each of these approaches had strengths and weaknesses related to the institutions that were initiating them.

Once potential students are recruited, additional screening is necessary. Each potential student needs to be evaluated to determine if they would be successful in the program as well as the industry. A successful student should be able to complete the classes and have a strong potential for job placement. Therefore it should be determined:

1. What are some of the requirements for the positions the program is targeting?

    a. Drug testing?

    b. Criminal records?

    c. English literacy?

    d. Physical requirements?

2. What type of background would students need to be successful in the courses?

    a. Literacy level

    b. Math skills

    c. Communication skills

If a TSA's is being held through a program where the students are already well known by teachers, it might be best for teachers to select the students based on a general criteria you develop. However, when you need to select and recruit students from the general public, it is important to have an application as well as interviews. It is important to determine if:

1. Students will be successful in the program

2. The students have an ability to attend all the classes (do they have transportation for the classes, do they have time to attend, etc.?)

3. Do the students have a high chance of being successful in finding careers after the program?

CASE: RECRUITING ADULTS FROM THE COMMUNITY

The majority of students in the TSA pilot programs were from Vermont Career and Technical Education Center programs. These programs were selected because they taught complimentary curriculums to the TSA such as construction and heavy equipment. Students in these courses were very successful in the TSA because they had backgrounds that prepared them for careers in transportation. Classes were taught during the school day so students did not need to find transportation to classes. Plus, the Career Center school teachers were able to guide and support the students through the program.

Finding and recruiting adults for the TSA program proved to be much more challenging and complex than finding high school tech students. Initially, outreach was conducted through a local non-profit experienced in working with adult training programs.   This non-profit utilized their newsletter, social media sites, and career fairs to recruit individuals for the program.

At first, many individuals were highly interested in the program. However, through a questionnaire and personal interviews, it became clear many of them would not succeed in the program for various reasons including:

- They were unable to attend class due to their work schedules or lack of transportation.

- They had a criminal record that would have disqualified them from many of the entry-level positions the TSA was geared towards.

In addition, many of those interested in this TSA offering were New Americans who were challenged with some degree of limited English speaking and literacy skills. It was determined to admit some of these students to the TSA despite the possible language barriers because they demonstrated a high degree of interest and willing to do extra work to succeed. While all of these students were able to complete the TSA, several did not pass a few of the certificate classes. It was decided that a language exam would be developed to better determine if students would be able to successfully complete the program.

One outcome of this effort for several students was a connection to other educational programs with the community college. These programs would help them refine their language skills and continue to work on courses and certificates that would advance them to future jobs in the field. The Community College programs were introduced during the program as a career building block that students could take advantage of once in the field. However, in this case for many students

A flyer designed to recuite adults
to a TSA pilot progam

pursuing these course turned out to be a more logical next step rather than a job application. Having a network of interconnected programs and partners insures a higher level of success options for participants.

Section 7. Curriculum Development

Key components of the TSA curriculum include:
1. Career awareness and preparation training.

2. Professional Certifications

3. Additional employer specific training

4. Internships/work experience

In order to develop this curriculum, first ask your employer partners, "What are the basic skills and certifications you would like a new employee to have?" These include both hard skills such as certifications, as well as soft skills, such as critical thinking skills, the ability to work as a team player, etc.

Career awareness and preparation training will be important for your students' success after completing the course. During these courses, students are introduced to the various employers, jobs, and careers available to them in the transportation industry. If possible, students can be given the opportunity to meet with employers and individuals in the industry to learn more about what their jobs would be like.

Professional certificates are extremely important to any TSA. These certificates will attract individuals from various industries that may not be interested in transportation, but are interested in the certificates. They will give creditability to the program, which will attract students as well as employers, especially in its pilot phase.

Additional employer specific training is the aspect of the TSA that sets it apart from other career training programs. It is best if these courses are developed by or with the input of employers. Classes can be developed around the skills employers wish incoming employees had, but regularly do not. It is best if a representative from your industry partner teaches these courses.

Internships and/or work experience courses always enhance a training program. It gives students real work experience, while they build connections with employers. Obviously, it will be best to find internships for your students with your program partners and your advisory board members. However, it may be difficult to find placement for all your students with these organizations, as a result research into internship opportunities needs to begin early in the process.

In the general transportation field, few apprentice level opportunities exist. With private employers there may be some on-the-job training opportunities, but most internships for students are likely to be short unpaid engagements or more on the order of job-shadowing. In any case, the value gained is in the direct opportunity for TSA participants to see the work being carried out and understand how the classroom learning links to success on the job. It is also an opportunity to be introduced to workers in the field and make sure the real work fits their understanding of what is needed, creating a more real set of expectations. It is also a chance to be introduced to future supervisors and people who may make hiring decisions and demonstrate the TSA participant's values and skills in the workplace.

CASE: THE VERMONT TSA CURRICULUM

While each pilot TSA program varied slightly in their curriculum, all had the following core courses (see appendix A for full course description and hours):

1. Introduction to Transportation Careers

2. Basics of a Good Road

3. Winter Roads

4. Worker Safety Basics

    a. First Aid/CPR (certification)

    b. OSHA 10 construction/garage (certification)

    c. Work zone safety/ flagging (certification)

5. Respectful work environment

6. Project Planning

7. Construction Math

8. CDL Basics

9. Job Shadowing/Internships

Select Slides from the Pilot TSA Curriculum Presentations

Basic Road Design

Winter Maintenance

Vermont Roads in 1900s
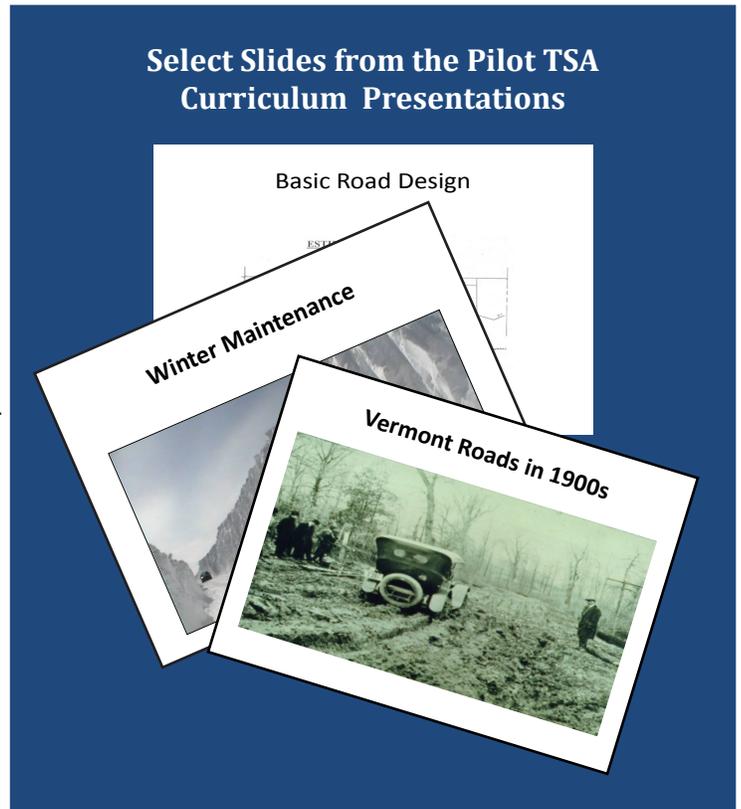
This core curriculum was developed based on the ideal qualifications for an entry level road construction position at VTrans. In reviewing the courses, one will notice that that only three out of ten are road maintenance specific (basics of a good road, winter roads, and project planning). The rest however, would be extremely useful to anyone looking to enter the transportation workforce, especially in the beginning of their career.

In discussion with employers and educators there was interest in offering optional adding optional courses that would add more value to the TSA as a credential. These included Chain Saw Safety, Tractor and Mower Safe Operation, Hand Tool Safety, Forklift training, basic Welding, etc.

Both employer partners and educators put a great deal of emphasis on the teaching of workplace "soft" skills. In all cases they agreed that the basic skills someone needs to be successful in the transportation field is built on a firm foundation of good work and workplace etiquette. The "Respectful Work Environment" module was developed in response to this need in addition to the other courses and programs that host institutions might have in place.

Case: Habits of Mind at the Community High School of Vermont

Prior to working with the TRC on developing a TSA appropriate for the population under the supervision of the Corrections Department, the Community High School of Vermont (CHSVT) had made a commitment to integrating the Habits of Mind technology across its institution. (http://www.instituteforhabitsofmind.com/). In their work plan they stated that they were "committed to integrating the Habits of Mind as strength-based cognitive skills of success that can be taught, coached, role modeled, and practiced. The Habits of Mind should be displayed through graduated practice as participants show growth in using the Habits in increasingly difficult situations."

"The Habits of Mind are an identified set of 16 problem solving, life related skills, necessary to effectively operate in society and promote strategic reasoning, insightfulness, perseverance, creativity and craftsmanship" including:

1. *Persisting*
2. *Managing Impulsivity*
3. *Listening with Understanding and Empathy*
4. *Thinking Flexibly*
5. *Thinking about Thinking (Metacognition)*
6. *Striving for Accuracy*
7. *Questioning and Posing Problems*
8. *Applying Past Knowledge to New Situations*
9. *Thinking and Communicating with Clarity and Precision*
10. *Gathering Data through All Senses*
11. *Creating, Imagining, Innovating*
12. *Responding with Wonderment and Awe*
13. *Taking Responsible Risks*
14. *Finding Humor*
15. *Thinking Interdependently*
16. *Remaining Open to Continuous Learning*

(After Arthur L. Costa and Bena Kallick, *Habits of Mind: A Developmental Series*, Copyright © 2000)

Educational institutions have employed many different approaches to endowing their students or trainees with similar employment and life skill sets. The comprehensive approach afforded by Habits of Mind at the Community High School of Vermont is just an example of a very effective one.

Section 8. Selecting and Finding Trainers

Finding and selecting the proper trainers for your program is an important step in making your TSA successful. Ideally, the institution will have trainers with a wealth of real world knowledge as well as individuals who have experience training and/or educating others. It is important to assemble qualified trainers who are able to accommodate the program schedule well in advance. For the certificate courses (e.g., flagging) or some of the modal specific units (e.g., Basics of a Good Road) the program will want to identify the best resource people. In the Vermont pilot, these were recruited from LTAP programs, the State Transportation Agency, and local industry.

Utilizing trainers from employers will greatly strengthen your program, but it is imperative that these individuals know how to train. Being an expert in a field does not automatically mean that you know how to teach that subject. A good trainer needs to have a strong understanding of the subject as well as how to teach that knowledge. Being a trainer requires a person to understand how others learn, as well as how to be a good communicator who is patient, passionate about teaching and in many incidences, have a good sense of humor.

CASE: HANDS-ON LEARNING IS BEST

Interactive and hands-on instruction is one of the strengths of the TSA. Many of the instructors from the pilot programs brought real life examples into the classroom. As one of the TSA instructors stated:

> *"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."*

In addition, for the CDL course, a simulator was brought in for the students to experience the feeling of driving a large vehicle. This experience was regularly cited as one of the highlights of the TSA curriculum for the students.

Finding instructors that can effectively implement this type of instruction can be difficult. The ideal instructor should have a good combination of real-world and training experience. The program's pilot phase benefited from having experienced trainers from the industry. However, as the program has grown it has been difficult to find enough trainers to meet the program's needs. As a result, the program has begun to train and recruit VTrans employees who are interested in supporting the program.

TSA Students Learning to Survey

Section 9. From Program to Job

It is important that from the first to the last day of class students are thinking about how they can apply the TSA to their future career. A good way to insure that students are continually thinking about their careers is to make the first class and last class of the TSA about career exploration. In the pilot programs of the TSA these classes were entitle Introduction to Careers in Transportation. During this course the following topics were discussed:

- The transportation industry and an introduction to the various careers available within it.

- Why each course in the TSA is being taught and how it can assist students in their careers.

- Teach students how to explain the TSA and what they learned in their courses to employers.

- Highlight where students should be looking for jobs, such as specific webpages.

Giving students time to conduct internet searches for jobs with the assistance of an industry expert or instructor can be extremely valuable. If students are entering the transportation industry for the first time, it is important to guide them in their job searchers.

CASE: INTRODUCTION TO CAREERS IN TRANSPORTATION

Over the years, the TSA has assisted many individuals discover and obtain careers in transportation. For example, a female adult student from a pilot TSA program had worked in many different fields including farming and hospitality. She heard of the TSA through a family friend who saw an advertisement of the program in a local newspaper. During the TSA she gained many new skills and found she was very interested in a career in road construction.

During her last TSA class, a representative from the state's human resource department came to speak with the students regarding career opportunities. At this time, she brought in an application for the state's temporary road crew positions. This class gave her the opportunity to discuss her application as well as introduce herself to the state representative. This student is now applying for a position with the state's On-the-Job training program for women and minorities and hopes to be working with the state within the next year.

Since many of the certificates from the TSA can be applied across industries, the program can help further the current career goals of a student, while introducing them to careers in transportation. One high school TSA student found the courses to be very helpful to his career in construction. After the TSA he was able to obtain a position as a lineman for a construction company. As he stated:

> *"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*

While the TSA did not influence this student to enter a career in transportation, it did help him future his career. In addition, it gave him insight into the transportation industry and the opportunities available to him. Currently, he is not looking to transition into any specific job in transportation. He did state that it was extremely helpful to learn about the industry and know what opportunities are available to him.

Section 10. Program Follow-up

Creating follow-up measures with the programs' students, teachers, trainers, and advisory board will allow for program reflection and improvement. Written and verbal evaluations will give you insights into how to improve your program for the future. You may even choose to hire a third party to evaluate the program, as was done for the pilot phase (see below for more information).

It is also important to have contact information for all program participants so that you may contact them well after they have completed the program. Knowing how participants have utilized the skills and certificates they collected from the TSA will help guide the program into the future.

Transportation Systems Academy

Certificate of Completion to:

The UNIVERSITY of VERMONT
TRANSPORTATION RESEARCH CENTER

- Winter Road Maintenance/Basics of a Good Road
- Transportation 101
- Project Planning
- First Aid & CPR Certificate (Red Cross)
- OSHA 10

Patricia A.
Hannaford Career Center

The Transportation Systems Academy was developed by the University of Vermont Transportation Research Center under a Transportation Education Development Pilot Program Grant from the Federal Highway Administration and in collaboration with Patrica A. Hannaford Career Center.

June 4, 2013

_____   _____
Lynn Coale, Director PAHCC   Date

An Example of a TSA Certificate

CASE: THE TSA DEVELOPMENTAL EVALUATION

In order to examine the pilot phase of the TSA programs an evaluation, developmental in nature, was carried out by a third party (see appendix B for the full evaluation report). The TSA evaluation had two main goals:

1. Capture the successes, challenges, and lessons learned from past TSAs.

2. Plan for the future by providing a foundation of best practices for future programs.

Data collected for the evaluation was done through semi-structured interviews with program personnel and participants. The evaluator also observed the planning and implementation process. They attended planning meetings as well as the classes.

One limitation of the evaluation, given that it was more retrospective, was that a limited number of former participants were able to be located for interviews. Keeping track of participants after they completed the TSA was difficult. In future programs, participants will be asked to keep in touch with the program so that their struggles and successes can be better tracked.

The evaluation has given the program coordinators great insight. It has been helpful in recording the lessons learned from previous programs and in developing best practices for the future. Some specific considerations that emerged from the evaluation included:

- The curriculum content and instructor qualities emerged as two themes that were specific strengths of the program.

    - 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.

- 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.

- The TSA produced some expected as well as some unexpected outcomes including

    - The TSA programs that were operated with the Department of Corrections had some unique challenges including restriction inside the facility and outside field trips were limited.

    - Operating a TSA program for adult students at CTEs also had specific challenges especially with recruitment. 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.

CONCLUSION

This document chronicles the learning process of developing, operating and evaluating the Transportation Systems Academy, a pilot effort to craft a job-readiness program focused on Highway Maintenance and Operations. The design of the program is such that it can and is being adapted to meet different needs of host institutions and students. It is not meant to be an off-the-shelf technology, though the curriculum and structure certainly could be applied as that. We believe that its best future success will be as an integrated part of existing programs in institutions dedicated to offering their students real opportunities for future careers.

APPENDICES

A. TSA Curriculum

B. TSA processes and guidelines at the Community High School

C. TSA Pilot – Developmental Evaluation

D. TSA – Training Resources

E. TSA Career Pathways

Course	Description	Hours*
1. Introduction to Transportation Careers	Overview of the transportation industry, operations, modes, careers, jobs, skills applied.	3-6 hrs.
2. Basics of a good road	This course teaches the basics of road rules, regulations, processes and care of maintaining good roads.	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.	5 hrs.
4. Worker Safety Basics		
4a. First Aid/CPR	*American Heart Association Heartsaver course or Red Cross First Aid /CPR* Leads to certificate	6-8hrs
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	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.	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
6. 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	6 hrs

7. 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.	38 hrs
8. 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	4 hrs
9. CDL Basics	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. 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.	20+ hrs
10. Job Shadowing	VTrans or DPW garage and/or construction site.	8-16hrs

Transportation Education Development Pilot Program

Transportation Systems Academy (TSA)

<u>Community High School of Vermont (CHS VT)</u>

<u>Process & Expectations Overview</u>

The Transportation Systems Academy (TSA) is geared at working with non-traditional labor pools to provide career awareness and skills training. The following outline will cover processes, expectations and accountability for students, instructors and employers who participate in the UVM Transportation Research Center's (TRC) TSA Program.

<u>CHS VT & Recruitment Process Expectations</u>

1. Perform the TSA selection process which is based on the following criteria:

   ✓ Program interest and commitment level.

   ✓ Release date is within 6 months to 1 year.

   ✓ Age.

   ✓ Housing is established before or shortly after release date.

   ✓ Willingness to enroll in the CHS VT.

   ✓ Commitment to completing program surveys including a post 3-year follow up.

   ✓ Currently in minimum or medium custody.

   ✓ Status of valid driver's license. (Based on a rating scale of 1-4 with 1=minimal action to be completed and 4=highest action to be completed.)

2. Necessary commitment level and skills to get and maintain a job upon release.

3. Help students create a plan to obtain a valid driver's license and pursue a CDL license.

4. Provide full time staff coverage during all TSA courses.

<u>UVM TRC Expectations</u>

1. Recruit TSA instructors.

2. Build business/education partnerships.

3. Oversee and coordinate program details of the TSA.

4. Compile survey data and generate reports.

5. Document lessons learned and complete program assessment to propose improvements.

Student Expectations

Upon acceptance into the TSA program, all students are expected to adhere to program requirements.

1. Committed to completing the following TSA courses:

   ✓ Municipalities/Transportation 101 (TRC)

   ✓ Construction Math (CHS VT)

   ✓ Citizenship & Community Participation (CHS VT)

   ✓ Winter Roads (AOT, TSI alumni)

   ✓ OSHA-10 (CHS VT)

   ✓ Basics of a Good Road (AOT)

   ✓ First Aid/CPR (CHS VT)

   ✓ Work Zone/Flagging (TSI alumni, VLR or Marilyn Savoy)

   ✓ Project Planning & Selling (TSI alumni)

   ✓ Supporting & Creating Respectful Work Environments (TSI alumni or Mark Heyman)

   ✓ CDL Basics (White Mtn. Community College: Paul Mundell/John Dyer-estimate pending)

2. Create a career portfolio with the help of an instructor, career counselor or case worker at the high school. (Resume certifications, recommendation letters, etc.)

3. Work with an instructor or career counselor to create a plan to obtain a valid driver's license before release.

4. Actively participate in all aspects of the TSA.

5. Students must sign a TSA *Student Program Agreement* before pursuing an unpaid internship*.

6. Request post-release requirements and schedule from probation and parole at least one or two months prior to the release date.

7. Create an availability schedule to give to the internship supervisor.

8. Once internship interest has been established, TRC staff will contact the appropriate District Manager at the local or state transportation agency to establish an appropriate line of communication for the student intern.

9. Upon permission, students will then contact the local or state transportation agency before release to begin the internship* application process.

10. Students should pursue temporary or full time employment and will connect with a career counselor that will help guide them in the career decision-making process and help to obtain access to additional training necessary for success in the transportation industry. Upon completion of internship, students should complete the following:

    ✓ Meet with supervisor about performance before completion of internship.

    ✓ Ask supervisor about current and future employment opportunities.

    ✓ Apply for any positions that are appropriate.

    ✓ Ask about additional training and requirements for employment.

11. Students should remain open and honest regarding legal issues when asked by a supervisor.

Instructor Process

Instructors are recruited by the TRC and high school staff and recruitment is based on the following criteria:

- ✓ Level of interest.

- ✓ Commitment to complete any prerequisite program related training. (e.g. teaching certification, Transportation-101, Bridges out of Poverty, etc.)

- ✓ Training and/or core curriculum expertise.

- ✓ Course knowledge.

- ✓ Availability and flexibility.

Instructor Expectations

1. Complete prerequisite program related training.

2. Complete all program surveys.

3. Exercise regular communication with the TRC staff and bring them program concerns.

Employer Expectations

All agencies or businesses who partner with the TSA agree to:

1. Contact the TRC staff at least 3 times during the TSA internship via email or phone.

2. Complete a TSA Internship survey.

3. Committing to at least one round of mock interviews with TSA students.

4. Commitment to delicately handling the legal issues and details of the TSA students.

* This is not a requirement, but is strongly recommended.