

West Virginia Transit Training Partnership Maintenance Training Asset Map

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Executive Summary

In the coming years, the public transportation industry will experience the loss of a number of skilled mechanics to retirement and other opportunities. With advances in technology it has become increasingly difficult to recruit adequately prepared replacement workers, and to train the incumbent workforce to the highest level of proficiency. In late 2009 a consortium of five transit agencies in partnership with their Amalgamated Transit Union locals began a joint labor-management initiative to address the current and future skill needs of their bus maintenance workforce. The project had four objectives:

- 1) Create an effective and sustainable labor-management process for training.
- 2) Gather and use data to determine training needs.
- 3) Develop a training plan.
- 4) Identify potential sources for training.

A labor-management committee structure was created consisting of a Policy Committee and a Work Group. The Policy Committee laid the groundwork for the implementation of a skill survey, the identification of training priorities, and the identification of training resources.

The identification of potential training resources to meet the needs of the transit maintenance workforce in West Virginia was conducted using an Asset Mapping process. The detailed skill gap analysis, which included the bus maintenance workforces of the five transit agencies, was used to guide the asset mapping process. In addition, the workgroup developed specific training curriculum designed to meet their needs.

The objective of the asset mapping was to identify major training assets relative to the needs of the transit industry, cataloging courses and training providers who can deliver related training. The outcome of the mapping process is providing information to the training partnership stakeholders on the availability of training, by region, to meet their needs.

Using the mapping process, analysts researched the technical training industry across West Virginia. Once the analysts focus turned to the educational institutions, both the Career and Technical Centers (CTC) and the WV State Community and Technical Colleges (WVSCTS) were found to have training provider assets. The analysts were unable to validate any other diesel mechanic training provider in West Virginia.

This report identifies the Career and Technical Centers and the Community and Technical College System as training assets. These institutions are currently providing Continuing Education, Adult Learning and Outreach, and in some instances, customized training for local employers. Examples are provided in the report and the attachments.

The data gathered and mapped identifies two CTC's and one WVSCTC as training provider assets for diesel mechanic training. All three institutions provide diesel engine maintenance curriculum and have the expertise and potential to customize and deliver transit specific training. The Institutions are:

- Wyoming County Career and Technical Center
- The Fred Eberle Technical Institute
- Bridgemont Community and Technical College

The report identifies how prepared the State's Technical and Educational institutions are to customize and deliver workforce training to meet the growing needs for a skilled workforce in West Virginia.

The competition to access the resources required to develop, customize and deliver workforce training increases as the dollars shrink. This mapping process identifies the existing links and networking that is already in place that would enhance how the CTC and the WVSCTC institutions can work together to provide the training that the employers need for their workers.

I. Asset Map Process Description

The first step in the asset mapping process was to identify existing diesel engine training programs within West Virginia. After building a long list of potential training assets, individual contact to the key training resource person was made through phone calls and e-mails for the purpose of establishing a dialogue concerning training opportunities for transit mechanics. Through this process, a shorter list was identified that included potential training programs offering the best opportunities for transit mechanic training.

Next, the research team gathered and analyzed curriculum and courseware. It was equally important to match the training assets with the training needs and to gauge the interest level and capacity of each of the potential training assets. This was accomplished through conversations and the sharing of documentation. Available curriculum was matched with the specific training needs identified through the skill gap analysis results.

A short list of training providers was created, matching relevant curriculum areas with potential customization opportunities. The list includes strengths and potential weaknesses of each training provider.

The key contact people at each institution differed due to the varying job titles the differences in categorization of programs. Depending on the institution, contact persons held positions in Workforce Development Division, Continuing and Community Education/Outreach, Non-Traditional Education Department and Professional Development, Lead Instructors and Training Coordinators.

The internet and direct contact were the main sources for researching the program and process of the Career and Technical Centers. According to the information posted, many of the Centers tailor a variety of programs to meet the needs of the adult population in the counties that they serve. There was a wide range of information provided on each Centers drop-down menus.

Numerous methods were used to contact the key personnel. Community and Technical Center's with curriculum listed on their website that was relevant to Diesel Mechanics were reviewed and contacted. Overall, the most effective method used that prompted a response was through e-mail; the least effective method was through direct phone. Once contact was made via e-mail, phone contact became more successful. Contact results can be found in Attachment C.

EDSI analysts developed a list that included potential training programs offering the best opportunity for transit mechanic training. It was important to match the training assets with the training needs and to gauge the interest level and capacity of each of the potential training assets.

The diesel engine training was found under the Automotive Technology Program, in the Diesel Equipment Technology course of study. As it relates to the Public Transit Industry, students coming out of these programs have the foundation for entering into an apprenticeship or entry-level diesel mechanic position.

II. Skill Gap Analysis Results Summary

A skill assessment, made up of responsibilities and tasks specifically designed for the transit mechanic, was administered to thirty-seven (37) public transit mechanics and technicians from the five transit authorities. The following agencies participated in the skill gap analysis project:

1. Kanahwa Regional Transportation Authority
2. Tri-State Transit Authority
3. Mid-Ohio Valley Transit Authority
4. Ohio Valley Regional Transit Authority
5. Central West Virginia Transit Authority

The mechanics responses led to a ranking of skill gaps and a prioritization of training needs based on common or shared needs of the agencies. The data in the skill gap report indicated a strong need for electrical-electronic training specific to the transit industry. This training includes multiplexing, computer controls, troubleshooting and diagnostics. A comprehensive computer training class has been recommended as a course offered for mechanics and technicians prior to any other electrical and electronic training.

Based on the skill gap analysis, a defined transit priority needs list includes:

- Computer Literacy –Basic and Intermediary
- Basic Electrical
- Transit Specific Electronics including Multiplex, PLC, Troubleshooting and Diagnostics

Other transit training topics with critical need include:

- Wheelchair Lifts
- Standard Transmission and Hybrid Transmission
- GPS
- Fuel Injection Pumps
- Fare Box
- HVAC System Dual Loop Carrier Units
- Hydraulics
- Welding
- Air Brakes and ABS
- Charging System
- Engine Emissions

III. Training Asset Identification

After analysis of the skill gap report, a matrix of prioritized training topics (see chart below) was developed to assist with identifying training providers or internal training capacity at the agencies.

Topics	Module I	Module II	Module III	Module IV
Electrical/Electronics	Electrical 101	Electrical Circuits	Control Devices	Circuit Protection
Programmable Logic Controllers	Introduction to PLC's	Troubleshooting and Maintaining PLC's	n/a	n/a
Multiplex Systems	Introduction to Multiplexing	Multiplexing Diagnosis and Troubleshooting	n/a	n/a

Types of Training

Successful training in the transit industry includes blending various training providers and approaches. Training provided by Original Equipment Manufacturers (OEMs) is common throughout the industry and is often delivered in conjunction with the arrival of new vehicles. OEM training typically is focused on a specific equipment or vehicle and is most effective when combined with a comprehensive training initiative.

Internal training leverages the capacity of internal instructors or the transit agency's subject-matter-experts. Internal trainers can also provide on-the-job training, which is inexpensive to implement. For an OJT program to be effective it should be highly structured. With some professional development, subject matter experts can be major training assets.

External training providers include publically funded technical schools and community colleges as well as for profit training schools and independent training vendors. Training on transit specific equipment often requires technical skills that are not readily available at public training institutions. The five participating transit agencies involved in this project currently do not have significant capacity to provide training for their workforce.

A long term goal would be to develop the capacity for a training program. The transit agencies can participate in shared training when applicable and use their subject-matter-experts to augment and assist in developing and delivering training.

Potential Training Providers

The short list of training providers below was created based on their ability to meet the needs of the partnership as identified from the results of the skill gap analysis. These training

providers, listed in the chart below, are the most capable in providing training to the transit agency.

Training Provider	Type of Program	Training Delivery	Specific to Need
Wyoming County Career and Technical Center (Pineville)	Technical Training Center	Off-site, Classroom, Hands-on	Diesel, Multiplex, PLC, Electrical-Electronic, Air Brake, Hydraulic-Pneumatic
The Fred Eberle Technical Institute (Buckhannon)	Technical Training Center	Off-site, Classroom, Hands-on	Diesel, PLC, Electrical-Electronic, Air Brake, Hydraulic-Pneumatic
Bridgemont Community and Technical College	Associate Degree or Certificate - Diesel Technology	Off-site, Classroom, Hands-on	Diesel Mechanics

Computer literacy and basic electrical training are standardized courses available at most Technical Centers and Community Colleges in the state. In general, transit specific topics are not available, but similar classes are available and could be customized to fit the specific needs of the partnership. A complete list of training providers contacted for this report can be found in Attachment A.

Barbour County School Bus Garage is listed as providing training for diesel mechanic training focusing primarily on heavy-truck and school buses. Several attempts were made to contact the Garage, however, calls were not returned and there was no email address listed.

IV. Mapping of Training Assets

Many training providers can provide some of the transit specific needs, but none can match all of the industry’s training needs.

Since training providers are not likely to tell potential customers that they are unable to meet their requirements, the strengths presented here are intended to assist transit agencies and the training partnership when select a training provider that can most effectively meet their needs.

	Course topics relevant for beginning and mid-level skills	Capacity to customize training	Capacity to deliver training	Partnerships with Tech Centers statewide	Diesel Engines and Components (hands on)	Hydraulics-Pneumatics	Electrical-Electronic	Diesel Mechanical Technical Associates Degree or Certificate
Wyoming County Career and Technical Center	•	•	•	•	•	•	•	•
Fred Eberle Technical Institute	•	•	•	•	•	•	•	•
Bridgemont Community and Technical College	•	•	•	•	•	•	•	•

The Wyoming County Career and Technical Center and the Fred Eberle Technical Institute appear to be among the best options for building a complete training program and laying the ground work for a training partnership through the State’s educational and technical training community.

Bridgemont Community and Technical College provides an Associate Degree in Diesel Technology with a Diesel Mechanics curriculum.

Within their fields, both have the capacity to customize training to fit the needs of the transit agencies. The Wyoming County and Fred Eberle CTC’s work jointly on curriculum and courseware development. Curriculum is approved at the State level and becomes standardized at the institutions.

The interest expressed from the Lead Instructors at both Centers in providing training to the transit industry is very high. Distance and location are logistical barriers but through developing regional training centers these barriers could be overcome. What is not thoroughly understood is the availability of the instructors to deliver training at transit agency locations.

The analysts believe it is a key opportunity to partner with the Career and Technical Centers and the Community and Technical College System of West Virginia to develop an In-State Transit Maintenance curriculum and training program.

V. Matching Training Needs to Training Assets

With some customization, Wyoming County Career and Technical Center and Fred Eberle Technical Institute show a willingness to provide the capacity to deliver entry and mid-level courses in transit specific topics.

Topics	Draft Curriculum	Wyoming County	Fred Eberle
Electrical/Electronics	Electrical 101	Yes	Yes
	Electrical Circuits	Yes	Yes
	Control Devices	Yes	Yes
	Circuit Protection	Yes	Yes
Programmable Logic Controllers	Introduction to PLC's	Yes	Yes
	Troubleshooting and Maintaining PLC's	Yes	Yes
Multiplex Systems	Intro to Multiplexing	Yes	Yes
	Multiplexing Diagnostics-Troubleshooting	Yes	Yes

Existing assets can be used as a pipeline for entry-level mechanics. Based on discussions with the lead Instructors and a review of the curriculum from the Wyoming County and Fred Eberle Tech Center, customization and curriculum development would be necessary to have the courses be suitable for the incumbent mechanic above a mid-level course.

Currently, courses are offered on a semester basis approximately 3 to 5 days per week, 12 weeks per semester. The lead instructors are responsible for designing the courses.

Training in Computer Use, Fundamentals of Electrical and Electronics, Programmable Logic Controllers, Collision and Auto Body and Welding are training topics that are more readily available across the state, through the CTC's and the WVSTC.

VI. The Career and Technical Center and Community and Technical College Profiles

West Virginia State Community and Technical College System (WVSCTC)

The West Virginia State Community and Technical College System (WVSCTC) is designed to provide a comprehensive community and technical college education in all regions of West Virginia. Another title given these institutions is the Community Technical College System or CTCS. The state has undertaken a process whereby the community colleges were renamed and became participating institutions of the WVSCTC or CTCS. Ten Community and Technical Colleges are posted on the WVSCTC website. These institutions are included on Attachment A.

The focus of the Community and Technical College System is on general education and technical skills and to provide workforce development programs to meet the demands of employers and enhance economic development efforts of the State.

The WVSCTC institutions are charged with collaborating with other providers in delivering education and training programs to the community and technical colleges. They serve a diverse student population through Associate Degrees, Certificates and Skill Sets; as well as, continued education and lifelong learning. The target audience for these institutions are in-state residents, degree seeking full-time students, 25 years of age or older.

The WVSCTC institutions offer 22 associate degree programs, 11 Certificate Programs, 12 Collaborative Degree Programs, and a variety of skill set certificates. Also offered are customized training, credit and non-credit training for business and industry through our Workforce and Economic Development Division. These institutions have an extensive off campus network of workplace based training sites throughout the service regions of the state.

The WVSCTC is a partner in the EDGE program, which is a link to the Career and Technical Centers. Analysts reviewed the certificate and associate degree programs and the curriculum that would be relevant to diesel mechanics including automotive technology, electrical and electronics, programmable logic controls, body repair and welding.

There is a transfer program offered under the Associate Degrees for students wishing to secure an associate degree before transferring into a four-year or bachelor's degree program. The programs provided at the CTCs Institutions are designed to meet the standards acceptable for transfer and are to be of equal grade and quality to those provided at the four year degree granting institutions.

There are examples of the community outreach and workforce development program activity at several of the institutions listed in Attachment C. This is only a representation and not meant to be a complete list of activities since all WVSTC institutions are providing this service.

One such example would be the Water Waste Treatment training program delivered by Mountwest Community and Technical College (MCTC). A local water company was in need of training in the operation of the mobile truck unit and its components. The Workforce Development Institute at MCTC customized the training to fit the specific needs of that utility company and delivered a training that left the customer satisfied enough that additional training opportunities are being discussed.

Career and Technical Centers (CTC)

The mission of the Career and Technical Center is to prepare students training for job entry in specific technical fields and provide the technical training courses that can be applied to advanced training opportunities or pursuing an associate degree. Students have the option to complete a 1 year Certificate Program at the Career and Technical Center. Curriculum and course titles are standardized throughout the system.

The Career and Technical Centers provide training at sites throughout the state. Programs using over 300 schools are available, covering every county in the state. Students at the secondary, post-secondary and adult levels are offered accessibility of training. Programs or clusters provided at the CTC's vary. For the purpose of this report, Diesel, Automotive, Electrical-Electronic and Welding were the focus.

Most CTC's are part of the local county school system. The target audience for the Career and Technical Centers begin at the secondary school level and move into adult education with returning students. These programs can provide a track to follow begin as early as middle school and eventually lead to the high school EDGE program.

The EDGE program (Earn a Degree • Graduate Early) allows students to take high school courses for community and technical college credit. This program is designed for the student who intends to earn an associate degree from a community and technical college. If a student tracks their courses correctly, a degree could be earned within one year. Courses are connected to a skilled pathway by a student's program and major.

As posted on the Career and Technical Education webpage, there are a variety of career and technical education facilities including 23 County Centers and 7 Multi-County Centers. There are three specialized facilities offering career and technical education and 25 high schools are actively participating as Career and Technical Education facilities. Analysts were unable to identify the specialized facilities.

The high school and career center programs offer technical education in five or more occupational areas. Information on which technology is offered at the various facilities is available on the careertech.k12 website and on the individual institution website.

Tech Prep is a program that provides multiple opportunities for students entering the workforce. The initiative requires a collaborative partnership between business/labor, postsecondary, and secondary educational levels. Its main purpose is to provide viable career options for individuals through a rigorous, seamless curriculum, work-based learning experiences, and career development. Tech Prep/Skilled (S/TP) leads to either an associate degree or a certificate.

Analysts noted that nine consortiums had been formed, each one serving several counties. The consortium link was between the high schools, Tech Prep programs, the Career and Technical Centers and the Community and Technical Colleges. Because of the name changes and restructuring of the system it is difficult to ascertain current status of the consortiums when researching through the internet.

VII. Conclusion

The labor-management workgroup has discussed providing training in three phases. The first phase would include computers and basic electrical, provided through local technical or vocational schools. The second phase of the training would include electronics, multiplexing and PLC's. Because there are no local training providers that can deliver transit specific courses, this phase of the training will include building the capacity of local training providers to deliver this training through providing OEM training to local trainers. The third training phase of training would include specialized equipment training provided by OEM trainers.

Direct contact was made with representatives from five of WVSTC institutions. Responses were received from all five institutions. E-mail was the most effective communication. Of the twenty-three CTC's listed, attempts were made to contact all that are listed as diesel or automotive schools. The analysts continue to receive responses from the CTC's even as this report is being finalized.

There is pipeline from the Wyoming County CTC and the Fred Eberle Technical institute which can lead to an associate degree from a Community and Technical College. Students coming from one of the two CTC diesel programs can transfer credits to one of the Community and Technical Colleges and complete the course requirements for Applied Science or General Technology. The Diesel Mechanics courses are completed at the two respective CTC's.

Students who transfer from one of the CTC diesel mechanic programs to Bridgemont Community and Technical College can pursue a degree in Applied Science - Diesel Maintenance and Repair. The college does have diesel curriculum.

Currently there is no single training provider or program that can provide long term training opportunities to the transit maintenance workforce in West Virginia. In the short term, Wyoming County Career and Technical Center, Fred Eberle Technical Institute and Bridgemont Community and Technical College System have existing programs that can be modified or customized to meet the training needs. Also, there is a pool of instructors available to provide the training.

Over the longer term, as this report indicates, the educational and technical institutions have the capacity and a shared interest in developing customized training. Many of the CTC's offer Automotive Technology and are certified in Automotive Service Excellence (ASE) and National Auto Technical Foundation (NATEF).

The Community and Technical College's provide an Associate Degree in Applied Science or Technology that includes Diesel Mechanic training, Automotive Technology and other fields of interest for the mechanic or technician trainee. A complete listing is provided in Attachment C.

The results of asset mapping process indicate that job analysis of the State's key industries would identify the specific needs of the workforce. The identification of the needs would then provide the basis for aligning, customizing and developing the required curriculum. The CTC's and the WVSCTC institutions are well positioned to provide the resources for the industry specific customized training development and delivery.

The transit agencies depend on the equipment specific vendor or OEM training for new equipment training. To handle the most urgent training need it is the most experienced employee (subject-matter-expert) who is called upon to do the work and/or provide some OJT to other workers. This method may 'put out the fire'; however, it is a temporary solution to the real need of providing skill upgrades through structured training process. This is the same in all industries.

The job analysis process identifies the specific tasks required to do the work. The tasks become the basis for a skill assessment to be completed by the workers. The analysis of the assessment results identifies the skill gaps and training requirements. The tasks then become the basis for the curriculum outline needed to provide customized training.

Using the job analysis process with the resources and expertise that the CTC's and the WVSCTC's provide, a network of regional training assets can be made available for industries, organizations and other employers across West Virginia.

There is considerable interest at the CTC and WVSCTC institutions with a continued networking effort which would help the institutions identify training needs, build a pipeline of job ready students for the industries and businesses within their service area.

Attachment A – Technical Training Providers in West Virginia

Training Provider	City	County	Topic
Wyoming County Career and Technical Center	Pineville	Wyoming	Diesel, Diesel Equipment, Hydraulic-Pneumatic, Electrical-Electronics
Fred W. Eberle Tech Center	Buckhannon	Upshur	Diesel, Diesel Equipment, Hydraulic-Pneumatic, Electrical-Electronics
Bridgemont Community and Technical College	Montgomery	Fayette	Diesel Technology-Diesel Mechanics, Electrical Technology
Kanawha Valley Community and Tech College	Institute	Kanawha	Applied Science (Associate Degree)
Mountwest Community and Technical College	Huntington	Cabell	Automotive Technology
Barbour School Bus Garage	Philippi	Barbour	Diesel Engine
Blue Ride Community & Technical College	Martinsburg	Berkeley	Electrical Distribution Technology
James Rumsey Tech Institute	Martinsburg	Berkeley	Automotive Technology, Diesel Equipment, Electrical Technology
Boone County Career and Tech Center	Boone	Boone	Electrical Technology
Cabell Career and Technical Center	Huntington	Cabell	Automotive, Electrical-Electronics
Calhoun-Gilmer Career Center	Grantsville	Calhoun	Auto, Electrical Tech
Fayette Institute of Tech	Oak Hill	Fayette	Automotive, Electrical-Electronics
South Branch Career and Tech Center	Petersburg	Grant	Auto Mechanics
Greenbriar East High School	Lewisburg	Greenbriar	Auto Mechanics
Tolsia High School	Fort Gay	Wayne	Auto Mechanics
Eastern Community and Technical College	Moorefield	Hardy	Auto Tech, Electrical Technology
United Tech Center	Clarksburg	Harrison	Auto, Electrical-Electronic
Roane-Jackson Tech Center	Leroy	Jackson	Auto, Electrical Tech
Carver Career Center	Charleston	Kanawha	Electrical

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Garnett Career Center	Charleston	Kanawha	Auto
Ben Franklin Career Center	Dunbar	Kanawha	Mechanics and Repair
Ralph R Willis CTC	Logan	Logan	Auto, Electrical-Electronics
McDowell Career Center and Tech Center	Welch	McDowell	Electrical Technology
Marion Co Tech Center	Farmington	Marion	Electrical Technology
Mercer Co Tech and Ed Center	Princeton	Mercer	Auto, Electrical-Electronics
Mineral Career Center	Keyser	Mineral	Electronics
Monongalia Co Tech and Edu Center	Morgantown	Monongalia	Auto, Electrical Tech
Nicholas Career Center and Tech Center	Craigsville	Nicholas	Diesel Equipment Tech, Electronics
Wood CC and Tech Center	Parkersburg	Wood	Automotive Technology, Electrical Technology
Pierpont Community and Technical College	Fairmont	Pierpont	Non-Traditional Tech Courses, Workforce Development
PRT Voc Tech Center	ST. Mary's	Pleasants	Auto, Electrical Tech
Putnam Co Tech Center	Eleanor	Putnam	Auto, Electrical Tech
Academy of Careers and Technology	Beckley	Raleigh	Automotive Tech, Diesel Equipment Tech
Hampshire County Career Training Center	Romney	Romney	Automotive Tech,
Hancock-JD Rockefeller Career Center	Hancock	Cumberland	Mechanics

Attachment B – Technical Training Providers Outside of West Virginia

Training Provider	Location	Training Delivery	Specific to Need
Wyotech Diesel Mechanic School	Blairsville, PA 724-459-9500	Training Center	Diesel Engine and Components
Thomson-Delmar Learning	Florence, KY 1-800-354-9706	Training Center	Customized Curriculum Diesel and Technology
Advanced Technology Institute	Virginia Beach, VA 1-800-468-1093	Training Center	Diesel Engine and Technology
Lincoln College of Tech	Columbia, MD, PA <i>*Affiliated with other Lincoln Institutes</i>	Training Center	Diesel
TDDS Tech Institute	Lake Milton, OH 1-800-475-8337	Training Center	Multiple Modules—Air Brakes
Universal Technical Institute	Morrisville, NC, PA, IL 704-658-1950 (NC)	Training Center	Diesel-Bus and Heavy Truck Mechanics
Nashville Auto Diesel College (NADC)	Nashville, TN	Training Center and Travel On-Site	Diesel
Motorcoach Training and Development Inc	Multiple locations 623-934-0909	Training Center or On- site	Customized Training
University of NW Ohio	Lima, Ohio 419-998-3120	Training Center	Diesel Engine and Components
Penn Foster Career School	Multiple locations 1-800-275-4410	Distance Learning	Diesel and Technology
Lincoln Technical Institute	East Windsor, CT 1-800-243-4242	Training Center	Diesel engine and Components
ABC Companies- Training	1506 3th St NW, Faribault, MN 55021 1-877-427-7278	Travel to On-Site Training	Customized Training Bus Maintenance, Components, Wheelchair lift
American Trainco	PO Box 3397 920 E Mineral Ave Ste 380, Englewood, CO, 80112	Travel to On-Site Training	Customize Training Bus Maintenance, Body Collision