



# Review of The Diesel Technician Shortage in Northwest Arkansas and Proposed Solutions

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## Executive Summary

Across the country companies are having difficulty finding qualified applicants for their skilled trades openings. Employers in Northwest Arkansas, a region with some of our country's largest corporate fleets and trucking companies, are challenged to find a sufficient supply of diesel technicians. Local companies are forced to spend more resources on recruiting and training and face longer periods without the full complement of skilled labor they need to grow. Companies bemoan that they are losing revenue by outsourcing more work, and turning down jobs because they do not have enough employees to do the work.



The Springdale Chamber of Commerce realizes that the shortage of diesel technicians is hindering its local companies. The Chamber contracted with Economic Leadership LLC to conduct a study of the diesel technician shortage and develop recommendations to address the problem. The research includes an analysis to measure current and future demand, interviews with local companies, student and parent surveys, and case studies reviewing successful training programs across the country. This report quantifies the extent of the problem and offers best practice solutions.

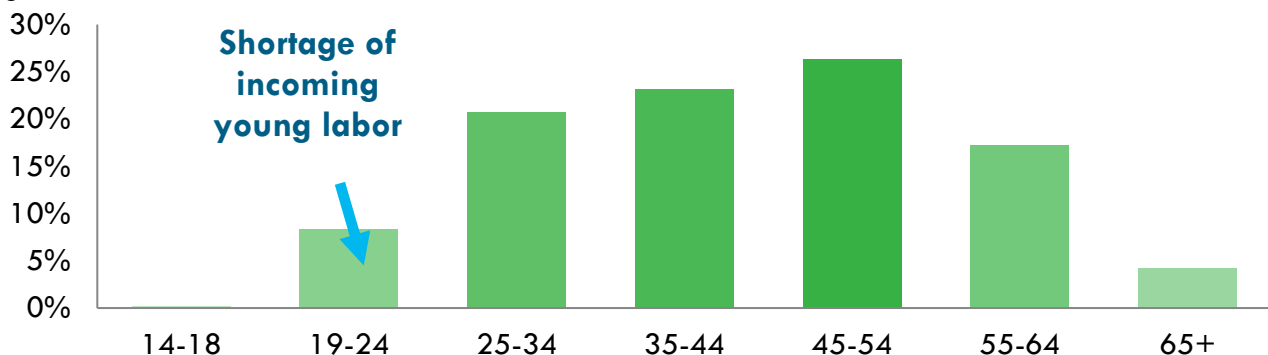
The data analysis revealed that diesel technicians were a strong occupation cluster in NW Arkansas, with robust employment growth and above average wages. On average, approximately 65 openings for diesel technicians are expected each year. The data also confirmed the threats to the labor supply pipeline. The regional workforce is aging and 21 percent of diesel technicians are expected to retire in the next ten years. The number of new entrants into the field is not large enough to fill these jobs. The local trade school supplies about 12 trained people into the workforce each year. **According to the data analysis, there is a need for 40 to 50 new diesel technicians each year to be trained in the Northwest Arkansas region.**

Across the state of Arkansas, the shortage is equally troubling with a shortage of 144 technicians per year.

Average of 65 diesel technicians openings each year

21% of diesel technicians are expected to retire in next 10 years

### Age Breakdown of Diesel Technician Workforce in NW Arkansas



Source: EMSI 2017.3

Interviews with local employers and educators further identified the immediate, specific challenges that exists within the training capacity in Northwest Arkansas. We believe that any solution to the supply problem of diesel technicians must address each level of the training spectrum.

## The Diesel Technician Training Spectrum



### Pipeline Issues:

- Limited interest in profession
- Students do not understand and are not exposed to the nature of the job
- Students lack basic mechanical skills
- Parents and educators prefer college preparation and often steer students away from skilled careers
- Women are often discouraged from mechanical and technical fields
- Language barriers limit pipeline expansion

### Training Program Issues:

- Small facility size
- Lack of curriculum certification
- Outdated equipment and curriculum

### Workforce Issues:

- Students are poached from training programs before graduation
- Companies want graduates with specialized ASE certifications
- A new employee must fund their own tools
- Training needs vary depending upon industry of employer
- High turnover rate
- Entry-level workers struggle to see career long-term benefits
- Workers are poached from other local companies

Based on this research, **Economic Leadership recommends that stakeholders in the region collaborate to create and support a high school based diesel technology-training program.** Public education students represent the best supply of potential workers to address the shortage, with about 585 students annually in the Springdale school district who will not be going on to college or possibly even graduating high school, and who may be beginning their careers in many fields. The program would require the construction of a dedicated training lab able to house several trucks and classrooms. The students in this program should graduate in four years with a diesel technician certification followed by a paid internship with a local company. Upon successful completion of their internships, students would be qualified to enter the field or pursue further education. Given the existing technical education infrastructure at Springdale's Tyson School of Innovation, the training program is recommended to be included within their educational programming. Successful implementation of a public high school diesel program in Northwest Arkansas can also serve as a pilot for similar programs to meet the demand across the state. Expanding the local trade school's capabilities to train adults is also recommended.

Coordinated efforts to educate students and parents on the benefits of the profession early in their education are crucial to the training effort. The survey results, detailed in the full report, indicate that

passive exposure to the trade will not be enough, information regarding training programs must be marketed and promoted to bring more students into the pipeline. Parents and students are unlikely to seek the information they will need on their own.

Creating a new high school program and expanding adult training will require collaboration between educators, local companies, and policy makers. All stakeholders must be willing to come to the table and commit to long-term contributions to the program. This report provides specific recommendations for each stakeholder group based on best practices, determined through interviews, surveys, and case studies of other successful training programs. Detailed proposals can be found in the recommendations section of this report.

This research has confirmed a serious supply gap of diesel technicians that is limiting the current and future economic potential of both Northwest Arkansas and the state. Local companies have been taking individual unilateral efforts to provide training to employees and appear willing to support a coordinated training program if they are granted input into curriculum and access to the students. Under this recommended plan, educators will be able to provide students with a debt-free technical education in a well-compensated career. Policy makers have the opportunity to create a model for trade based education that supports Arkansas' students and companies. Economic Leadership believes the severity of the gap merits the investment and commitment from stakeholders across the state to implement these recommendations.

## Recommendations for Stakeholders

### Companies

- Treat training programs as an essential part of the company's supply chain.
- Provide input to curriculum of diesel technology programs by serving on, and leading, the advisory board of training programs.
- Supply training programs with necessary funding and training equipment.
- Offer students paid internships.

### Policy Makers

- Change the rhetoric towards skilled trades.
- Provide funding for facility construction and equipment leases to be used for training.
- Reduce regulatory impediments including charter teaching permits and insurance liability that limits internships.
- Measure and evaluate training programs.

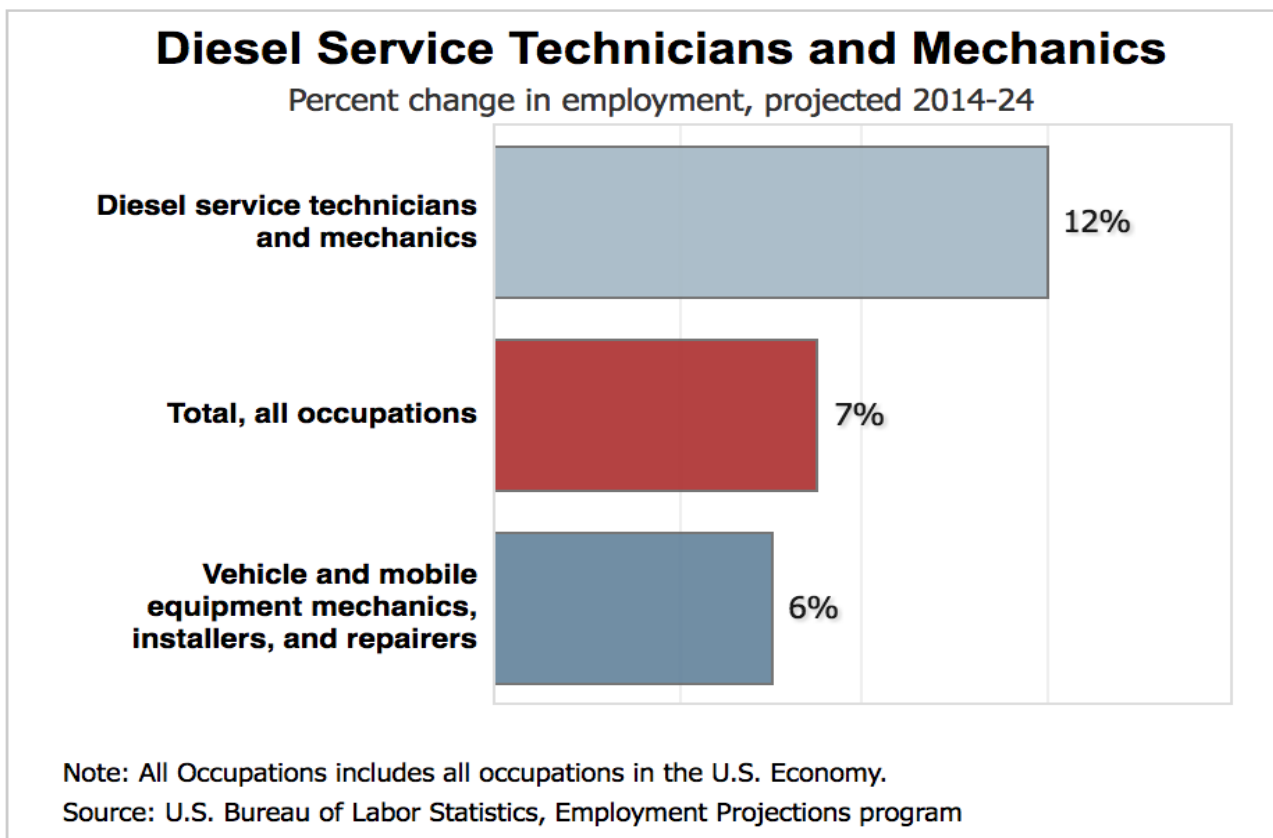
### Educators

- Create a high school based diesel technology-training program.
- Expand adult training capacity.
- Change the rhetoric towards skilled trades.
- Expand the pipeline of students with interest in diesel technology.
- Improve and certify the curriculum.
- Partner with local companies to ensure curriculum matches their needs.

## Part I - Introduction

As America continues to recover from the Great Recession, the economy is in transition. Technology is impacting almost every industry and every occupation. The skills needed to be successful at a job are evolving, creating persistent and troublesome skill gaps. Not very long ago, a diesel mechanic might have been viewed as a “grease monkey” and expected to spend their time doing only hands-on mechanical work. As the diesel engine has become increasingly digitized so has the job of those who service them. In fact, the job title has changed from mechanic to technician. Today’s diesel technicians must have good computer skills in addition to mechanical problem solving. The technology changes every year and many training programs that supply diesel technicians struggle to keep pace with the technology demands of the trucking industry.

The need for new computer skills combined with an aging workforce has created a labor shortage for diesel technicians. According to the Bureau of Labor Statistics (BLS) the national trucking industry will need over 31,600 new technicians by 2024 to meet growing demand and replace the large number of expected retirees. Diesel technician jobs are predicted to grow at a higher rate than the average for all occupations according to the BLS. With vehicle downtime costing companies and the struggle to find new technicians, addressing the shortage requires new partnerships and strategies to recruit and train the next generation of diesel technicians.



Springdale, Arkansas, the greater Northwest Arkansas region and the state are being negatively impacted by the diesel technician shortage. The region is home to three Fortune 500 companies (Tyson Foods, J.B. Hunt Transportation, and Wal-Mart) and over 1,450 other companies have offices located in the region. With a major transportation company and several poultry processing businesses located nearby, trucking is a significant part of Springdale's economy. The diesel technician shortage is acting as a throttle, restricting the economy's growth.

To evaluate the shortage and develop a strategic plan to recruit and train more diesel technicians, we collected employment data, reviewed training programs across the country, held stakeholder interviews, and surveyed students to understand the problem in the region. In-person interviews were conducted with multiple regional stakeholders including top employing companies, the state trucking association, and technical schoolteachers.

The information collected was focused on the following four topics:

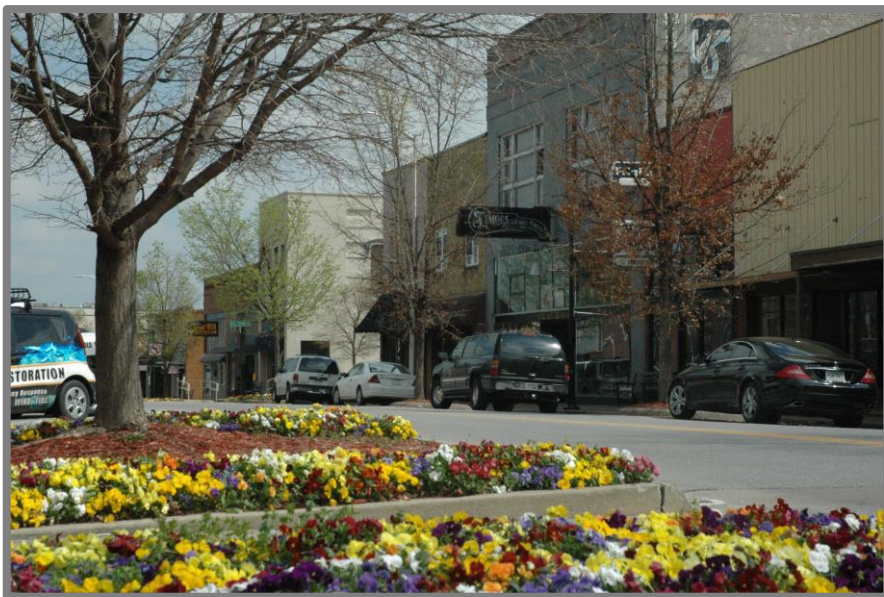
- ❖ the current demand from local businesses,
- ❖ current and potential supply available in the education system,
- ❖ best training methods, and
- ❖ interest from local companies and original equipment manufacturers in supporting training efforts.

This report provides the findings from that analysis and offers a plan to train more qualified diesel technicians.

### **Methodology for Data Collection**

In this section, the demand for diesel technicians in Northwest Arkansas is analyzed by reviewing data on current jobs, wages, growth, and concentration. Employment data from Economic Modeling Specialists International (EMSI) was utilized. The geographic

area for the analysis is the four-county region of Northwest Arkansas including Benton, Washington, Carroll, and Madison counties. As the labor gap of diesel technicians is also an emerging problem for the state of Arkansas, data for the state is included.



Originally, Economic Leadership chose to use the occupation code designated as Bus and Truck Mechanics and Diesel Engine Specialists (SOC 49-3031) to capture data for diesel technicians in the area. This occupation is defined as jobs that, “diagnose, adjust, repair, or overhaul buses and trucks, or maintain and repair any type of diesel engines.” However, this analysis did not reflect the actual number of diesel mechanics known to be in the region. After discussions with regional business owners, the occupation pool for this analysis was expanded to include additional occupation codes.

A thorough review of job posting analytics using the search term “diesel engine repair” revealed that diesel technician work was being captured in other occupational groups. EMSI is a CareerBuilder subsidiary and its software offers the ability to amalgamate millions of online job postings for specific skills. Using this job posting analysis, a list of regional occupations that had “diesel engine repair” listed as a skill in the job description was produced. From this list, percentages were derived for each occupation group’s share of all area diesel technicians. The chart below shows the percentages applied to employment data for diesel technicians in the four-county region.

### Diesel Technician Occupation Groups for Northwest Arkansas

SOC	Description of Occupation Groups	Percentage Diesel Tech Employees
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	19%
49-3023	Automotive Service Technicians and Mechanics	10%
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	100%
49-3041	Farm Equipment Mechanics and Service Technicians	1%
49-3092	Recreational Vehicle Service Technicians	20%
49-2092	Electric Motor, Power Tool, and Related Repairers	1%
53-3032	Heavy and Tractor-Trailer Truck Drivers	10%
53-1031	First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators	3%
49-9041	Industrial Machinery Mechanics	2%
51-9199	Production Workers, All Other	5%
49-9071	Maintenance and Repair Workers, General	2%
51-9198	Helpers--Production Workers	1%
11-3071	Transportation, Storage, and Distribution Managers	2%
51-3093	Food Cooking Machine Operators and Tenders	1%

Source: EL calculations from ESMI 2017.3

For example, the occupation group First-Line Supervisors of Mechanics, Installers, and Repairers accounted for about 19 percent of all the “diesel engine repair” job postings in Northwest Arkansas. In 2016, there were 779 employees registered in the First-Line Supervisors of Mechanics, Installers, and Repairers occupation group. Based on this data, we estimate that 19 percent of these workers require skill in diesel engines; therefore 148 employees from this group were counted as diesel technicians.

Input from local stakeholders was conducted through in-person interviews with 11 companies in May of 2017. These companies ranged from Fortune 500 fleet managers to local repair shops. A additional meeting with four representatives from the Arkansas Trucking Association was held in July 2017. Training programs were chosen for case studies based on recommendations from industry contacts. Viewpoints of students and parents were added from a survey collected during a camp run by the local trade school.

### Why Diesel Technicians?

An undersupply of diesel technicians is part of a larger trend nationwide in skilled trades. According to the Harvard Business School report, *Bridge the Gap: Rebuilding Americas Middle Skills*, since the 1980s there has been a growing gap between the skills needed by employers and the skills available in the workforce. Nationally, many in the education system have focused, and are often judged on whether students were heading off to four-year colleges to prepare for high-skill, high wage jobs. Those who were not a fit for the university environment often found themselves unprepared for middle skilled opportunities and migrated to in low-wage and low-skilled employment. The Great Recession

exacerbated this gap. Today, millions of Americans remain unemployed or are not participating in the labor force at all, while simultaneously there are millions of open jobs in skilled trades.

The Springdale Chamber of Commerce has chosen to focus on diesel technicians specifically because of opportunity created by the regional concentration and the quality of the jobs for those appropriately skilled. Diesel technicians stand to earn a higher living wage, even higher than other skilled trade jobs, such as machinists. The career also offers a pathway to gain certifications and advanced training that can lead to a six-figure salary at the highest levels.

## Comparison of Occupations in Northwest Arkansas



Source: EMSI 2017.3

## Comparing Occupations

The chart above shows a handful of occupations compared to diesel technicians in terms of earnings, employment, and concentration levels. Concentration, or location quotients, shows the level of employment in the NW Arkansas region compared to national levels. A location quotient higher than 1.2 often indicates that a region has a comparative advantage in that occupation. **A key strength of the diesel technician occupation is its concentration in the area, which is about 70 percent higher than the national concentration.** This confirms and demonstrates that diesel technicians are a strong occupational cluster and contribute to revenue gained from non-regional sources. In terms of wages for

this occupation group, diesel technicians' median wage is higher than many other skilled trades and jobs that require less than an associate's degree. Jobs such as computer programming and nursing earn a higher hourly wage, but often require a 4-year bachelor's degree that can leave students with significant debt.

## Wages

Median wages for diesel technicians are about \$18.40 per hour in the region. Wages are the highest in Benton County at \$19.10 per hour. Workers earning in the 10<sup>th</sup> percentile earn \$13.20 an hour while workers in the 90<sup>th</sup> percentile earn about \$28.40 an hour. Diesel workers in the region earn a higher median wage than diesel workers across Arkansas but about \$2 an hour lower than the national median wage. However, when the cost of living was factored into the wages, Northwest Arkansas was very comparable with the state and national levels.

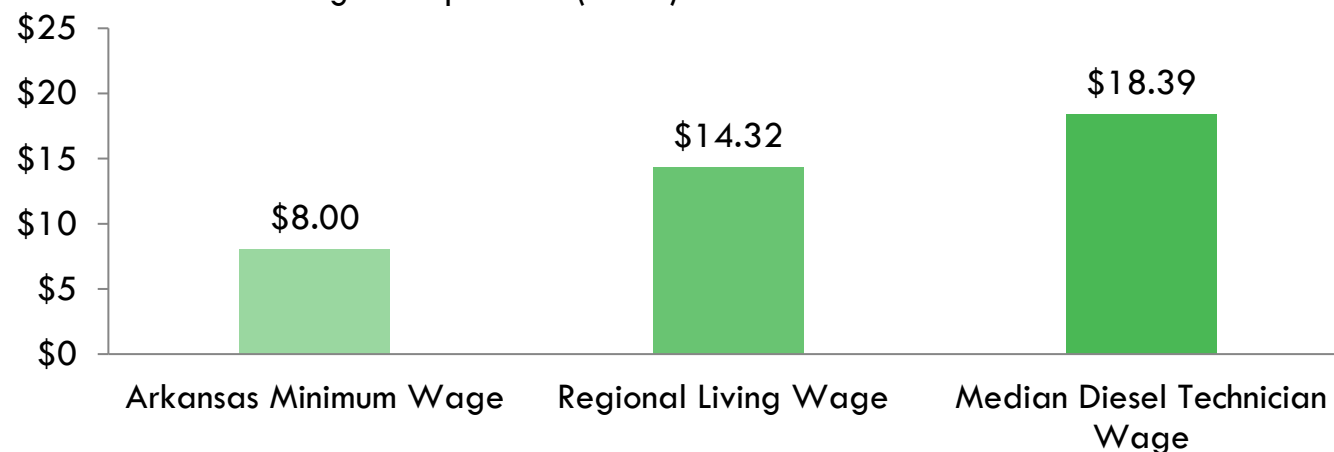
### Median Hourly Wage for Diesel Technicians (2016)

Income Adjustment	Northwest Arkansas	Arkansas	United States
Non-Adjusted	\$18.39	\$17.87	\$20.78
Adjusted	\$20.38	\$20.43	\$20.78

Source: EL Calculations based on EMSI 2017.3 & Tax Foundation (2016)

According to the MIT Living Wage Calculator, the individual wage required to support a family of four (2 working adults and 2 children) is \$14.32 an hour in the Fayetteville-Springdale-Rogers, AR metropolitan statistical area. Living wage estimations go beyond federal poverty measures and account for necessary spending on childcare, healthcare, housing and transportation. Individuals earning a living wage can maintain self-sufficiency. For comparison, the minimum wage in Arkansas is \$8.00 an hour. Given these benchmarks, the wages of diesel technicians are significantly higher than the living wage thresholds. These higher wages can provide individuals in the region an opportunity to make a salary beyond basic needs and are able to use the extra income to save, contribute to local businesses, and purchase capital assets.

### Diesel Technician Wage Comparisons (2016)



Source: EMSI 2017.3 & MIT (2017)

When interviewed, local employers found the published hourly wage listed for the diesel technician occupation to be too low. They believed that overtime and incentive pay, when factored in, raises the hourly wage. The reality is that hourly wages are listed by companies in a wide range, varying by experience and type of employer. According to local employers, initial pay for new mechanics varies between \$15 to \$22 an hour.

A certificate from the National Institute for Automotive Service Excellence (ASE) is required by many companies to advance to higher pay grades. ASE certifications can earn a technician up to \$3 more per hour in some companies. If a technician moves beyond entry-level and garners the necessary certifications, their hourly wage, including some overtime pay, can push upwards to \$65 an hour.

**Several companies mentioned that they estimate that an average technician could expect about \$50,000-\$60,000 in earnings each year.** This would put the estimated average pay, across all experience levels, to be between \$25 and \$28 an hour. Companies also noted that wages are rising consistently at a rate of three percent each year in the region.

### Other Job Benefits

Beyond solid earnings, the companies interviewed suggested being a diesel technician is an attractive career because of the quality of life it provides. The work has a “clock-in, clock out” mentality that allows workers to leave the pressures of the job at the site and not take it home with them. The career offers other long-term financial benefits like pensions and eventually compensation that can be higher than some management positions. **Local employers expressed that often, young entrants into the field are less keen, and undervalue, on these longer-term occupational benefits.**



A benefit that may be more attractive to young adults is the ability to earn a quality wage with quicker schooling and without hefty sums of student loan debt. As four-year degrees become increasingly expensive, many stakeholders felt that this may be a more enticing draw.

### Drawbacks

Companies willingly admitted that the job is tough. Although the job is not the ‘grease monkey’ profession it once was, the work still involves grease, and getting your hands dirty. Computer work has become a large part of the job, but there is no shying away from the manual work and companies admit some recruits are not prepared for or interested in the gritty part of the job. Another observation is that those that embrace the manual aspects of the work might be less enamored with the computer or technical requirements. Finding employees that enjoy the balance is part of the challenge.

Stakeholders also discussed that the environment of the shop is not always comfortable. Some repair shops are not temperature controlled and in Northwest Arkansas that can mean the hottest days of summer underneath a hot engine or freezing temperatures in the winter. Some of the local companies

have fleets that operate around the clock, which means shift work may be a component of the job. In some companies, if a night shift job opens, then the position will be filled for the night shift, and if the worker wants to switch to a day shift they may have to wait until there is an opening. Stakeholders expressed that some workers have waited for years to move to the day shift and are still waiting. This type of schedule may be challenging for workers with family commitments, or it may exclude them from social interactions.

A diesel technician career is advantageous to the employee because it creates value for companies and provides a high starting wage, with a pathway to even higher earnings. Despite these benefits, parents or educators are not promoting careers in diesel technology. The career now requires a unique blend of mechanical and technological skills that is challenging existing training programs. Future labor supply must exhibit an interest in this type of hands-on work and be comfortable in a gritty environment. This demands an educational system that can recognize students with this aptitude so they are encouraged into proper training programs.

Given the unique requirements of addressing the diesel technician gap in the region, the Springdale Chamber of Commerce chose this occupation as its focus amidst a national skilled trades deficit. The Chamber believes that addressing the diesel technician shortage in the region could offer solutions to scale at the state level. It would also provide a model for addressing other supply gaps in skilled professions.

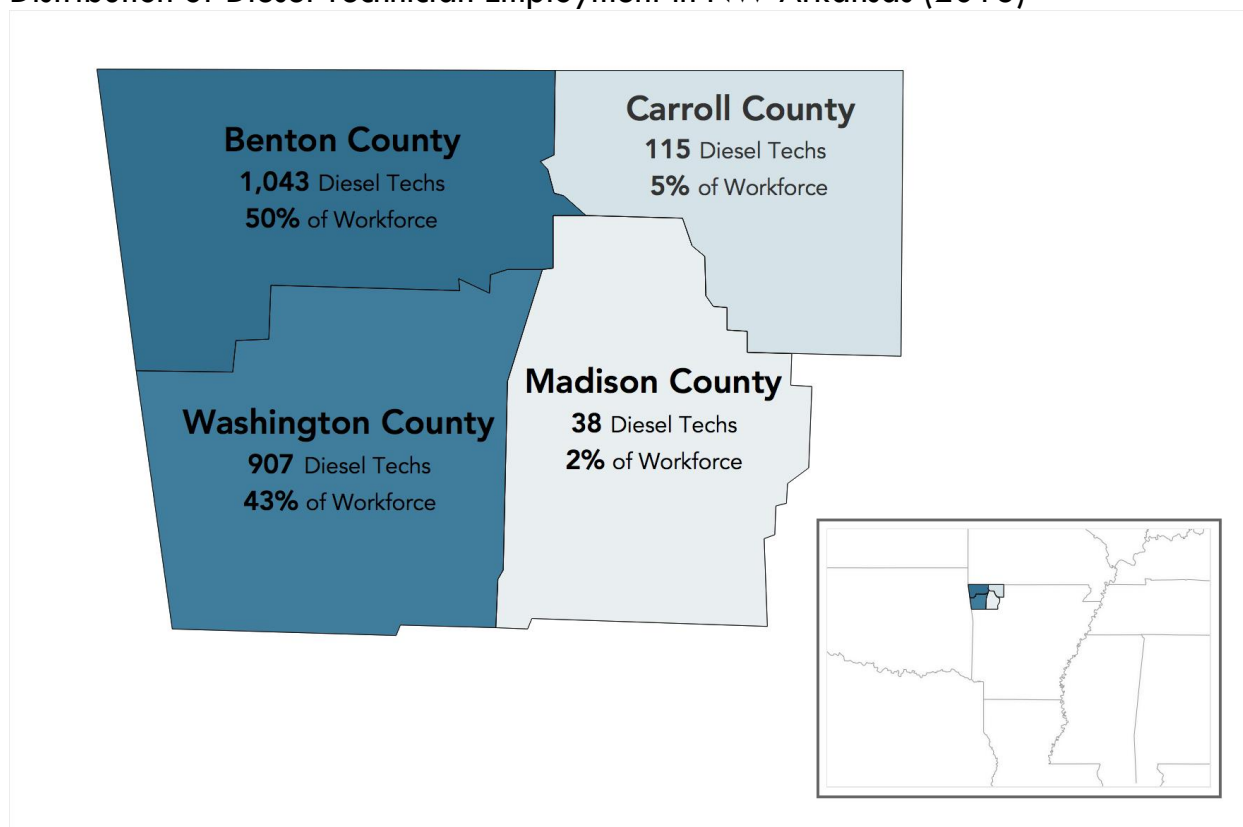
## Part II - Demand for Diesel Technicians

To best understand the shortage of diesel technicians in the region and in the state, we sought to quantify the problem with data. These numbers were then shared and discussed with local companies to provide an estimate of the average annual demand of new diesel technicians. Demographic data for the occupation is also reviewed in this section to understand the nature of those entering the diesel pipeline.

### Current Employment

In 2016, there were 2,103 diesel technicians in NW Arkansas. Most of these jobs are concentrated in Benton and Washington Counties, accounting for 50 percent and 43 percent, respectively, of Northwest Arkansas' diesel technician employment. This data reflects jobs that are located within the county's borders. Across the state of Arkansas there were 9,729 diesel technicians in 2016. NW Arkansas accounts for over 21 percent of all the diesel technicians in the state.

### Distribution of Diesel Technician Employment in NW Arkansas (2016)

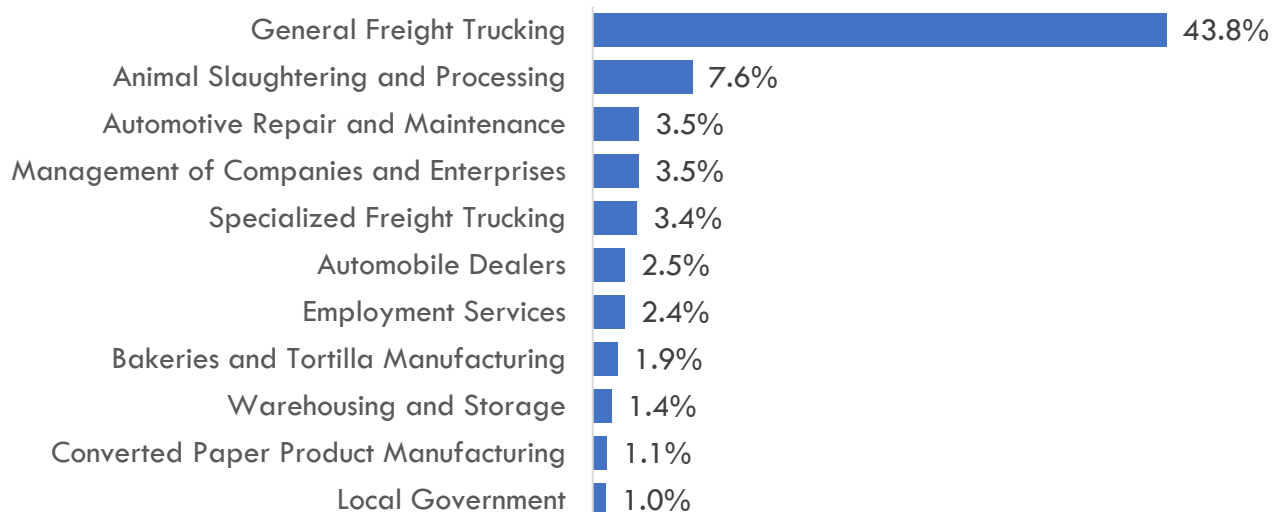


Source: EMSI 2017.3

### Employing Industries

Diesel mechanic work is required in many industries within Northwest Arkansas. However most, about 44 percent, of diesel technicians in the region work for freight trucking companies. Beyond that industry, diesel technicians are split between a variety of industries. Animal slaughtering and processing (due to Tyson's large regional presence) and automotive repair and maintenance employ 7.6 percent and 3.5 percent of all the diesel technicians in the region.

## Industries that Employ Diesel Technicians in Northwest Arkansas



Source: EMSI 2017.3

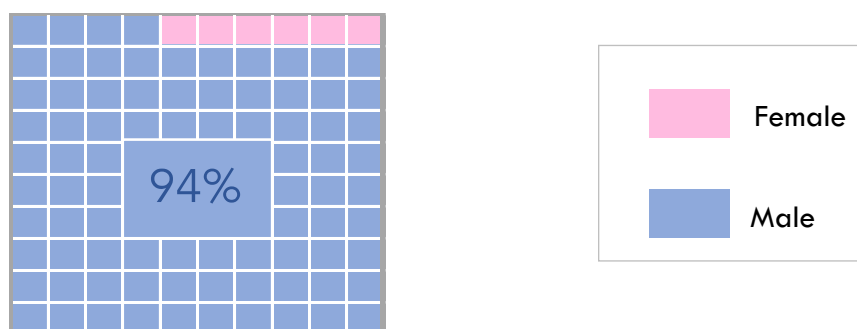
The data for Arkansas shows a more diverse industry grouping as general freight trucking employs only about 25 percent of the diesel technicians. At the state level, automotive repair and maintenance companies employ more diesel technicians by percentage than in the NW Arkansas region. **Overall, the NW region has more corporate fleet and freight employers by percentage than the state. At the state level, automotive dealers and repair companies are a larger stakeholder.**

As discussed in Part III of this report, the industry in which a diesel technician will work will inform the training that technician needs. To positively impact the skill demands of business, a regional training program must focus its training requirements on the needs of the freight trucking industry but also teach the skills specific to other major employers. A technician working in a dealership might need to be more specialized than a mechanic at Wal-Mart conducting routine service. This can best be achieved through continuous employer engagement and employer input in the training curriculum.

## Diesel Technician Demographics

Historically, the diesel technician profession has been male dominated. Across the United States, only four percent of diesel technicians identify as female. In NW Arkansas that number is slightly higher with females representing six percent of the workforce. At the state level, the percentage of females working as diesel technicians is slightly lower than the NW region at about 5 percent.

### Gender Breakdown of Diesel Technicians in NW Arkansas



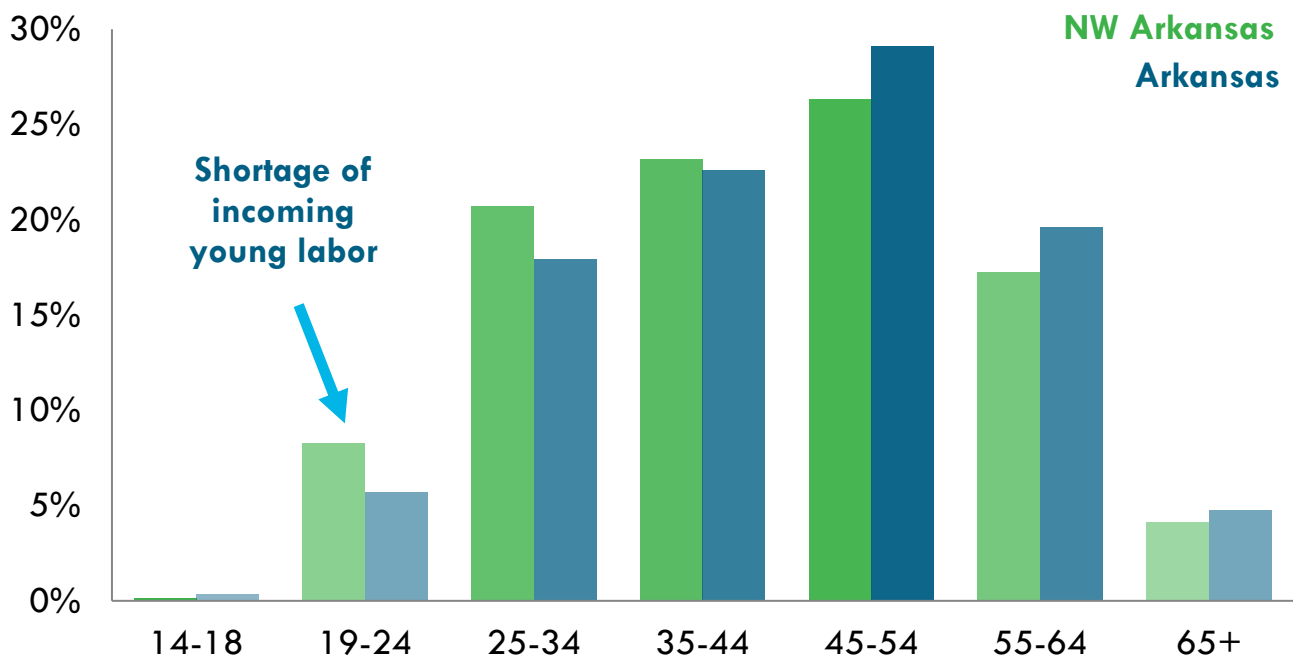
Source: EMSI 2017.3

Local employers interviewed believed the lack of women in the workforce was a result of women being less likely to be exposed to mechanical and technical work early in their lives. Societal expectation for careers for women seems to play the leading role in this trend. Several stakeholders knew of a female employee in their shop, but females in the profession are almost always the only female in the shop. With a nationwide trend of promoting STEM education for young women, there is an opportunity to leverage computer-skilled, problem-solving women who are also interested in working hands-on and beyond the constraints of an office desk.

The aging of the current diesel technician workforce is a major concern to many employers. Over 21 percent of the workforce is likely to retire within the next ten years. Within the next 20 years, over 47 percent of the workforce will have retired. There is also a noticeable drop in the pipeline in the entry-level age group of 19 to 24 years old, representing only 8 percent of the workforce.

Across the state of Arkansas, the workforce is even more dependent on older workers. In the next ten years, 25 percent of the workforce is expected to retire. **About 54 percent of the diesel technicians across Arkansas are expected to retire in the next twenty years.** The state data reveals an even lower percentage of younger workers in the profession, with 19 to 24 years old representing only 6 percent of the workforce.

### Age Breakdown of the Diesel Technician Workforce



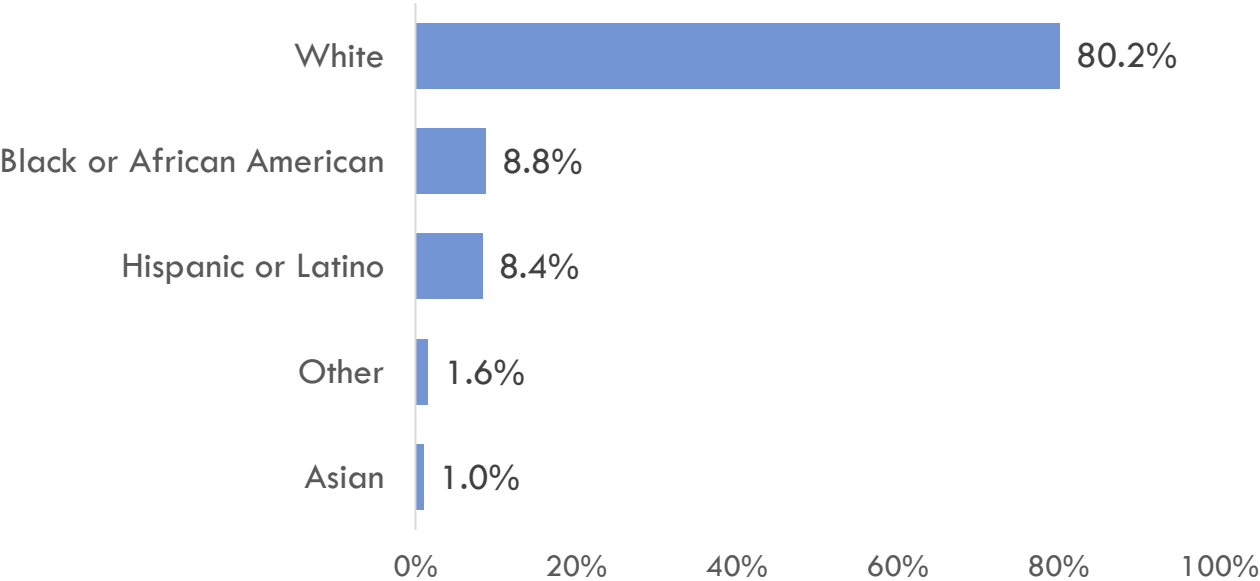
Source: EMSI 2017.3

This data suggests an urgent need to focus on younger students for the future health of businesses in the region. Recruiting younger talent to train to work in this profession will increase the likelihood of the new recruit's ability to handle the evolving technologies of the diesel engine.

The ethnic make-up of the diesel technician workforce is predominately white. At almost 80 percent of diesel technicians, there is a higher percentage of white people in this field than there are across all occupations in NW Arkansas (78 percent). The largest minority group represented in the workforce is African Americans at 8.8 percent. Hispanics currently account for 8.4 percent of the diesel mechanic workforce. Across Arkansas the ethnic make-up of the profession is similar to the NW region with white

people accounting for 80 percent of the workforce. However, African Americans account for 12 percent of the workforce and Hispanic people accounts for just 5 percent at the state level. Promoting diversity within this field, especially targeting minority youth, may help make the job more attractive to all students within Northwest Arkansas and throughout the state.

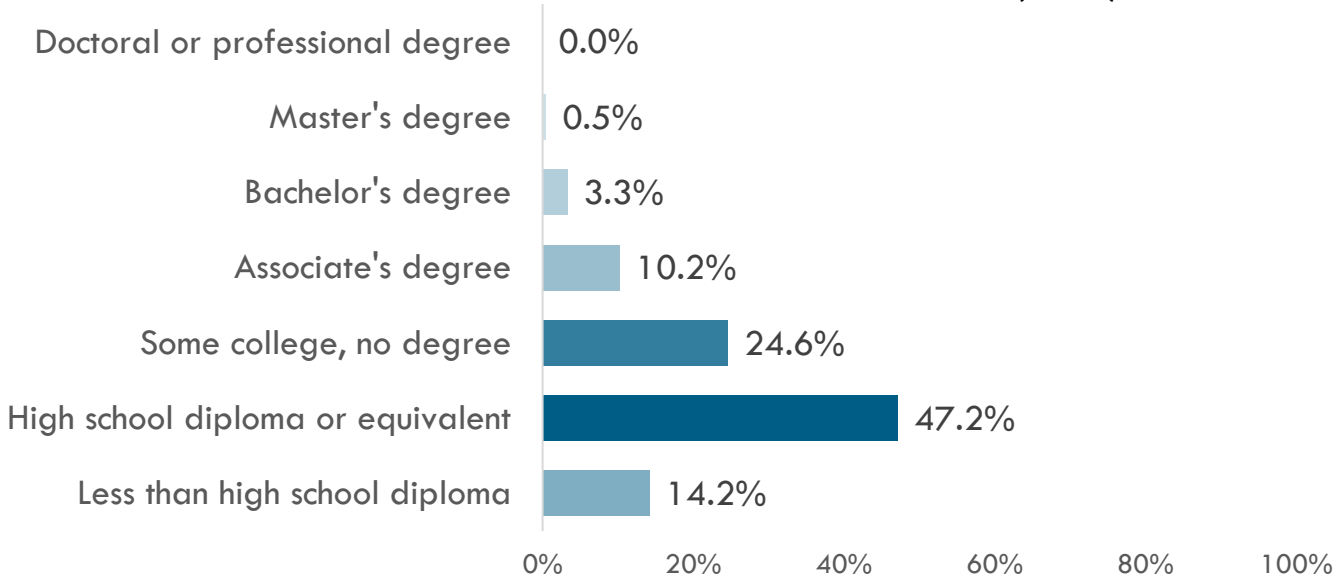
Race and Ethnicity of the Northwest Arkansas Diesel Technician Workforce



Source: EMSI 2017.3

The educational attainment of the current diesel technician workforce is collected at the national level. In the United States it is comprised of workers with associate degrees (10%), some college (25%), and high school graduates. About 61 percent of the workforce did not continue their education past high school. This highlights the need for specialized training at a younger age before students finish their educational career.

National Educational Attainment of the Diesel Technician Workforce (2016)



Source: EMSI 2017.3

## Growth Trends for Diesel Technicians

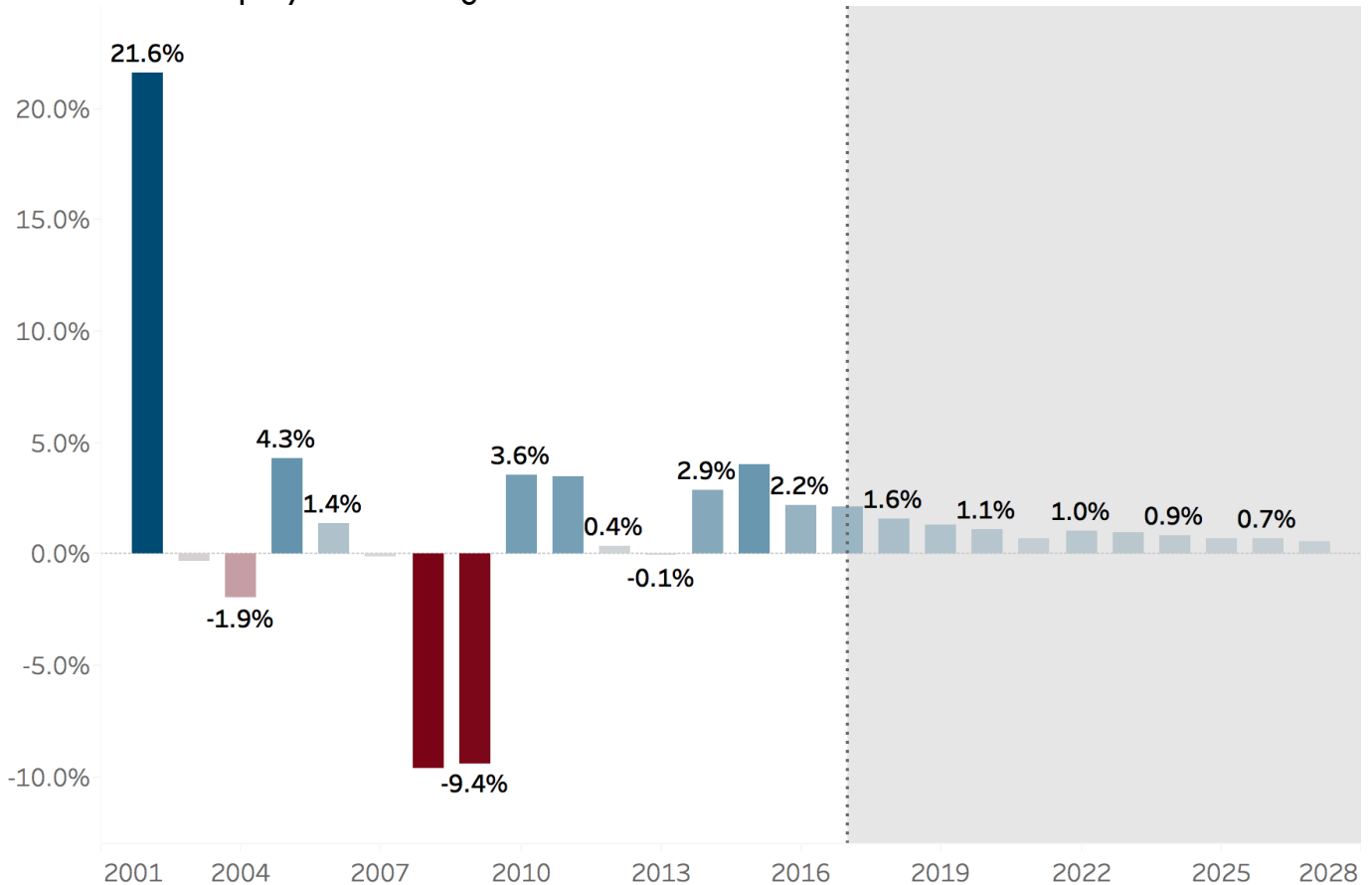
The region's growth in diesel technician employment has been much stronger than the state of Arkansas and on par with the national average. These higher rates of growth are also predicted to continue over the next five years. Regional diesel technician employment is expected to grow by 5.9 percent from 2017 to 2022. Arkansas has lower rates of growth, but still substantial with an anticipated expansion of 3 percent in the next five years. Demand in the region is strong and recruiting and training the next generation of diesel technicians is imperative to maintain the success of the regional and state economy. The inability to secure enough trained employees would hamper future growth.

### Five-Year Growth Rates for Diesel Technicians

Timeframe	NW Arkansas	Arkansas	United States
2011-2016	9.8%	1.9%	10.3%
2017-2022	5.9%	2.8%	5.8%

Source: EL calculations based on EMSI 2017.3

### Year-to-Year Employment Change for Diesel Technicians in NW Arkansas



Source: EMSI 2017.3

After years of variability before and during the Great Recession, the regional diesel technician market has stabilized and seen steady growth. From 2015 to 2016, the growth rate was 2.2 percent. In the next ten years, employment is expected to grow at yearly rates of two percent and below.

## Hiring Efforts

One way to understand employment demand is to review online job postings. Job postings were reviewed for diesel technicians in NW Arkansas and the state from January 2012 to January 2017. This analysis only represents a portion of recruitment, as other forms of advertising occur offline, but it can provide insight to company efforts and trends. The evaluation of EMSI job posting analytics demonstrates a rising demand with the number of online job postings increasing.

Since January 2012, over 8,900 job postings for diesel technicians have been posted. Many of these postings are duplicates as companies who are unable to fill a position post the job again. Once the duplicates were removed it is estimated that there were about 1,490 unique job postings during this timeframe. This means there was a posting intensity of seven job postings for one unique position. The chart below shows how, over time, the posting intensity increased dramatically. Companies in NW Arkansas are putting in more effort in their searches and are having to post a diesel technician job numerous times to find the right candidate.

Total vs. Unique Postings Trend

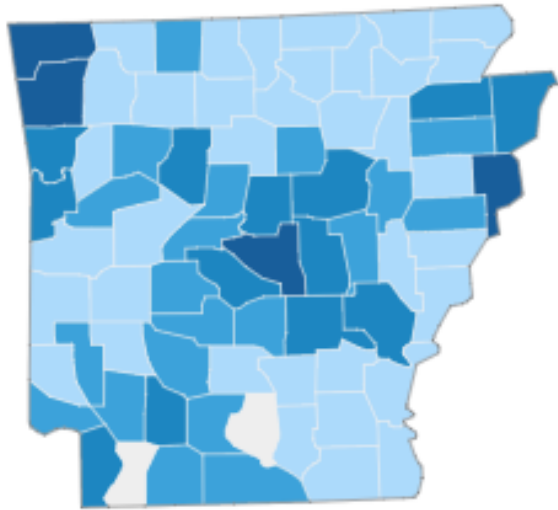


Source: EMSI 2017.3

Springdale, AR was the city in the region with highest number of job postings with 620 unique postings from 2012 to 2017. Springdale job postings were almost four times higher than the next city in the region. At the state level, Springdale had the second highest postings behind Little Rock, AR. Lowell, AR and Bentonville, AR were the next two top cities for diesel technicians in the region. The top hiring companies were Ryder System, Inc., J.B. Hunt Transport Services Inc., and Wal-Mart Inc. Each of these companies had over 100 unique job postings from January 2012 to January 2017.

Computer systems skills were the top requested skill for postings for diesel technicians, with about 63 percent of postings specifically requesting that hard skill. Soft skills were less common in the postings, but 128 postings did require strong project management/scheduling skills. Further results from the job posting analysis can be found in the appendix.

## Unique Job Posting Intensity in Arkansas by County, 2012-2017



Source: EMSI 2017.3

Overall in Arkansas, there were over 67,400 total job postings for diesel technicians from January 2012 to January 2017. About 9,980 of these job postings were unique. The posting intensity is similar to NW Arkansas at a rate of seven job postings for one unique position. **The number of unique job postings for this profession have increased by 300 percent from 2012 to 2017.** Pulaski County had the highest number of unique job postings with over 2,580 during the study period. The second and third most postings came from Washington County and Benton Counties with over 840 and 600 unique postings respectively.

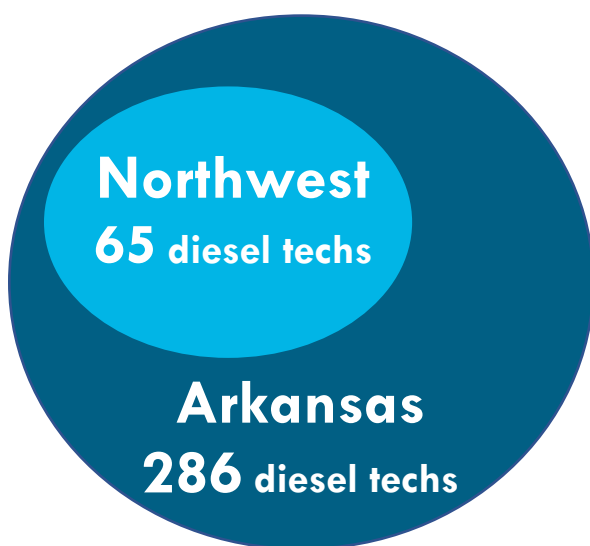
### Employer Outreach

One lesson learned from the company interviews was that online postings might not reflect the actual needs. As several human resource representatives noted, they did not bother posting new openings

online, as previous online postings remain unfilled. **Therefore, one company may only have one job posting for a diesel technician online, but the real need could be for five technicians.** Other smaller employers said that they preferred to advertise diesel jobs on Craigslist, which is not captured in job posting data. Employers found the informal nature of the website allowed them to remove some of the formalities of official job postings and speak more directly. Hirers noted that the people they are trying to recruit respond to this straightforward language. This context indicates that the job posting analysis in this report is likely underreporting the demand for diesel technicians.

### Predicted Demand

While growth and job posting data show that demand for diesel technicians is rising, policy makers will be best served with a concrete number of positions that need to be filled. The magnitude of the issue can dictate solutions. EMSI software calculates an estimate of annual openings. This measure, based on BLS methodology, accounts for the jobs that will be needed to fill the needs of an occupation as a result of both job growth and replacement. Replacement refers to the number of workers need to replenish those workers who retire or leave the profession.



In Arkansas, from 2017 to 2027 there is an expected demand for over 2,850 diesel technicians. This equates to an average annual demand of 286 workers per year. Almost 90 percent of the that demand is from the need to replace workers leaving the trade, with the balance of the openings attributable to expected growth.

Source: EMSI 2017.3

**In the NW region, 654 job openings are predicted for the next ten years.** This results in an average 65 diesel technicians needed each year. Job growth accounts for 13 percent of demand, with the remaining positions opened for replacement.

Economic Leadership asked each company interviewed about the extent of their deficit. Business is strong for many of the regional employers, and transportation needs continue to grow with online shopping. Each company stated that under an ideal applicant scenario they would hire about one to five new diesel mechanics each year for the foreseeable future. **This indicates that the region would need about 40-50 qualified diesel technicians each year.** Stakeholders confirmed the relative demand that was shown through the data analysis. These figures will inform the scale of recommended efforts necessary to train the next generation of diesel technicians.

### Part III - Current and Potential Workforce Supply

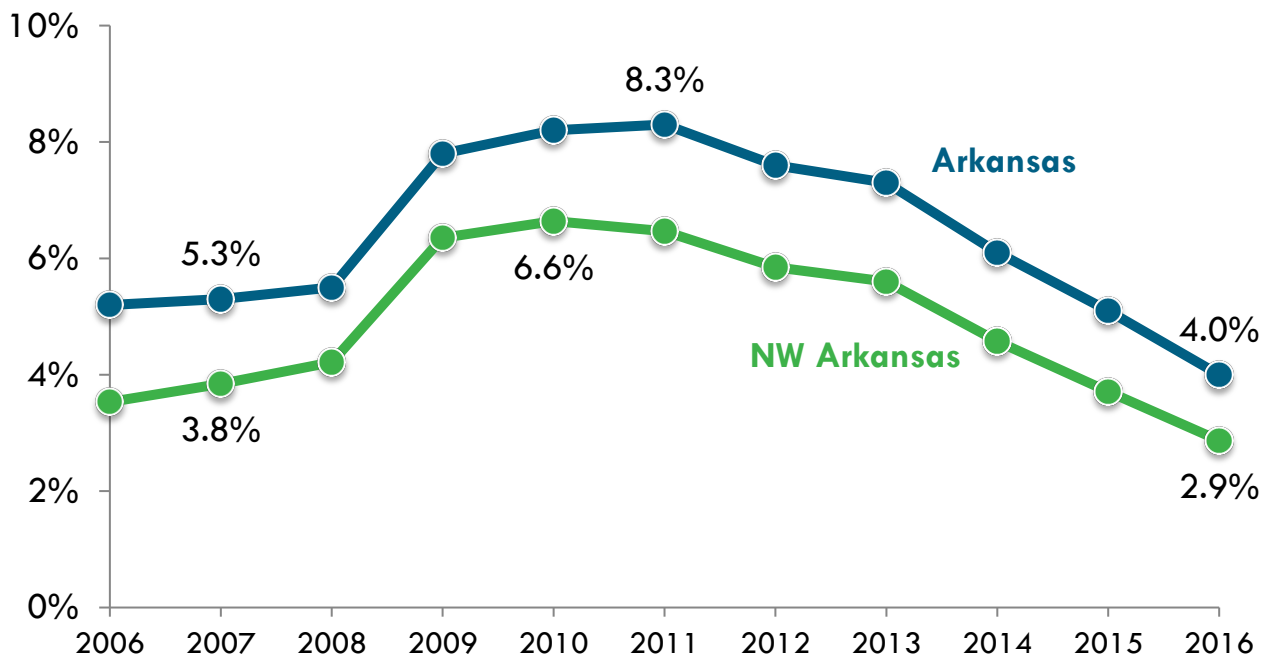
This supply analysis provides an understanding of the current shortage of qualified diesel technicians available to employers. Potential sources of workers and trainees are discussed to demonstrate the how the shortage may be met.

#### Supply from Existing Workforce

Every local employer interviewed acknowledged struggling to find quality diesel technician talent in the current regional labor market. Several of the national companies that were interviewed were quick to point out that the shortage of diesel technicians is a national issue. Several companies expressed frustration at the open positions they would gladly fill if they had adequate talent applying.

Some of this regional difficulty can be tied to the region's low unemployment rate. Northwest Arkansas has seen unemployment hover around three percent since August 2015. With most of the workers with skills able to find gainful employment in the region, companies admit that the applicants for diesel technician positions seem to have less, and less relevant, work experience. Across the state, there is just a slightly higher percentage of unemployed workers at four percent.

#### Annual Unemployment Rates for Northwest Arkansas and Arkansas, 2006-2016



Source: BLS (2017)

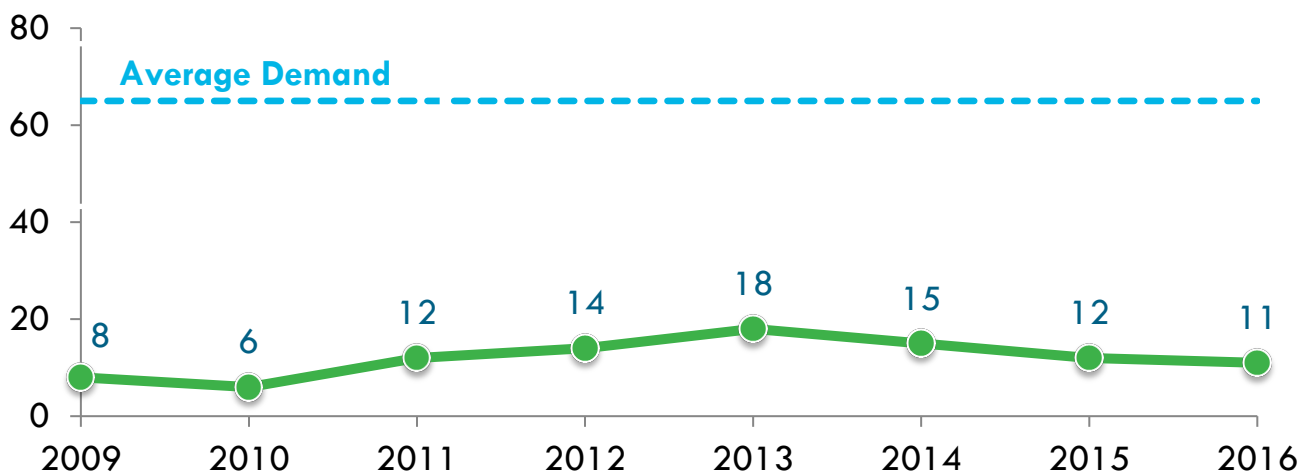
#### Current Supply from Training Programs

Given the region and the state are close to full employment, the existing labor force does not provide much opportunity to help address demand. Local companies are then more reliant on training programs that are readying workers to enter the labor force. According to the online education website, Study.com (2017), diesel technicians can follow the following steps to enter the field:

- Earn a high school diploma and complete 3-4 years of training
- Earn a certificate and/or an associate's degree in diesel engine repair or service technology

The most common pathway to the profession is through a certificate program offered at a trade school, university, or community college. In the Northwest Arkansas area, the only diesel mechanics technology certificate program is offered by the Northwest Technical Institute (NTI), a trade school located in Springdale. This program takes 18 months to complete and serves mainly non-traditional students looking for a new career. According to the Integrated Postsecondary Education Data System (IPEDS), NTI graduates 12 students on average from their diesel technology program each year. In terms of quality, local employers felt that NTI graduates are adequately prepared and perform well in the profession. The diesel program is currently unable to operate at a higher capacity due to a lack of qualified applicants and resources.

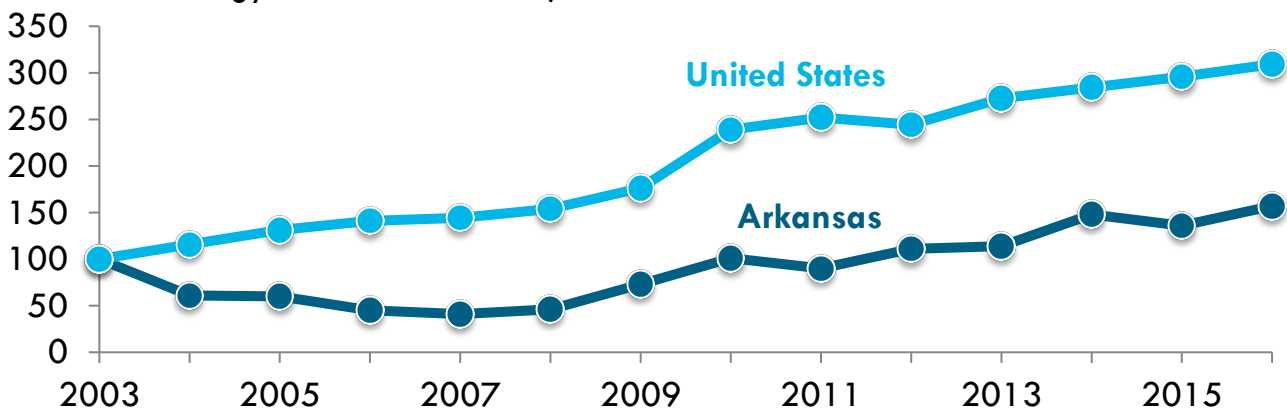
### Diesel Technology Graduates in Northwest Arkansas, 2009-2016



Source: EMSI 2017.3

Across the state of Arkansas there are nine diesel technology training programs, including NTI, that produce 116 graduates, on average, each year. Nationally, more students are completing diesel technology programs. From 2003 to 2016 in the United States diesel graduates have increased by 209 percent. Arkansas has been behind on this trend as the number of diesel graduates has only increased by a rate of 57 percent.

### Diesel Technology Graduate Growth, 2003-2016



Note: 2003 graduation levels set to 100 as a baseline Source: EMSI 2017.3

## Supply Gap

Interviews with NTL revealed that a few students are poached away by local companies before graduation. Employers, pressured by their scarcity, recruit the students early. Companies take advantage of the basic training provided by NTL and offer any advanced instruction that may be needed on-the-job. Therefore, NTL is preparing slightly more technicians than its graduation rate suggests. While not every student stays to earn a certificate, almost all of students who enter the program find employment. Based on placement and graduation data provided by NTL, it is estimated that about 5 additional diesel technicians are supplied to the workforce each year.

The data from the demand section estimates that 65 diesel technician openings are expected annually. With the region, via NTL, churning out 12 annual graduates and 5 poached students, **the shortage in Northwest Arkansas is quantified at about 48 workers each year.**

### Suggestions for Existing Diesel Technology Programs

Overall, local stakeholders were pleased with NTL's product, but they did want to see more resources provided to their program so it could improve and expand. The consensus from speaking with the educators and the companies was that NTL could be more effective if it could take on more students and have up-to-date equipment. According to NTL in interviews their biggest struggle is staying current with an industry that is constantly changing.

#### Strengths:

- Almost all students are placed into the local workforce
- Students perform well on the job
- Internship program with local companies successful

#### Opportunities for Improvement:

- Expand capacity to produce more graduates
- Replace outdated tools and technology
- Increase software and diagnostics training for students
- Add ATA electronics to the curriculum
- Graduate students with DOT brake and vehicle inspection certification
- Offer ASE test prep for working diesel technicians

The raw graduation data for Arkansas suggests that the supply gap remains a problem. On average, 116 students are graduated from diesel technology programs in the state. The demand analysis indicated a need for 286 new diesel technicians annually. Therefore, **the yearly supply shortage in Arkansas is approximately 170 workers.** (Data for student poaching was not available at the state level, and not included.) This shortage is also predicted to grow in the future. Stakeholders interviewed expressed that they expect the number of diesel openings to be three times higher than current levels in 15 years. If training conditions remain the same, the supply gap in NW Arkansas could be as high as 144 diesel technicians annually by 2030.

**““Their biggest struggle is staying current with an industry that is constantly changing””**

from NTL interview

## Dealing with the Shortage

Under these conditions of high demand and minimal supply, diesel technicians have extra bargaining power. This makes keeping quality employees no small task. A competent technician will often leave to make \$0.50 more an hour at an employer down the road. Companies are frustrated that there is less loyalty in the current market. One company stated their turnover rate was about 70 percent after 90 days on the job. This can be quite painful if the company has spent resources to train the worker, which has become common in this market.

To compensate for the shortage in experienced applicants, employers are spending company time to train new employees. Interviews revealed that local companies are working unilaterally with varying strategies to bring their diesel mechanics up to par. Resources in the region may be better spent on a uniform and efficient process for training.

Some companies stated they pay to send employees to schools outside of the region. For example, one local employer sends their diesel technician staff to a training program run by Caterpillar in Oklahoma.

**Investing so heavily in their employees early puts the companies at risk, particularly given the high turnover rate. If an employee decides to switch jobs or careers, that investment can be lost.**

**“We could save millions of dollars each year if we had better trained technicians.”**

from Industry interview

Companies also indicated that demand in other industries can exacerbate their diesel technician shortage. For example, some of their best employees might leave when there is a boom in oil prices. The workers leave for the higher, albeit temporary, wages in oil field work. Those that migrate also feel confident that their employers will take them back in oil bust times. Companies in the region have little option but to rehire these employees due to the absence of quality replacements.

As positions have continued to go unfilled, diesel shops are forced to alter their operations. Local companies have begun to outsource some of their repair work to the truck dealerships. This method is often not timely and is usually pricier than doing the repairs themselves. As one interviewee phrased it, “We could save millions of dollars each year if we had better trained technicians.”

## Potential Supply

Although the current lack of qualified diesel technicians is an obvious stakeholder concern, meeting the demand is possible. Recruiting and training around 50 new high-quality diesel technicians annually in the region, and 170 throughout the state, seems achievable. Stakeholders will need to work towards increasing capacity, streamlining certification, and improving curriculum at training centers. In addition, the pipeline of potential diesel technicians needs to be significantly expanded.

## Opportunities to Expand Talent Pool

Similar to the demographic data presented in Part I, stakeholders acknowledged that the diesel workforce is overwhelmingly white and male. Companies felt that despite this predominance, there were other individuals, non-white or non-male, which had excelled in the job. Communities that the stakeholders felt might perform well as diesel technicians include ex-military and the Hispanic community. Veterans are appealing because they tend to have the soft skills from a more rigid military

environment as well as some mechanical or technical background. Given the regions proximity to Fort Smith, AR there is an opportunity for outreach to soldiers who are reentering the job market.

The Hispanic community makes up 16 percent of the total population in Northwest Arkansas and is expected to grow by more than 17 percent over the next ten years. Companies noted, in their experience, the work ethic and mechanical aptitude tended to be strong in the Hispanic community. Several hirers indicated that this is an untapped resource in their industry. Some employers worried about the English proficiency of applicants from the Hispanic community. Training efforts that reach out to this community would need to address any potential language barrier.

NTI teaches night classes and according to them, about 90 percent of those night classes are ESL classes targeting the Hispanic community. They did note that the NTI connection with that population could be leveraged for the diesel program.

Efforts to market and welcome these communities to try the profession can increase the number of applicants. For example, in Arkansas public school districts the Diesel Mechanics I technical education course is the most male dominant course at 99 percent. This lack of exposure at younger ages impacts the potential supply. Existing statewide efforts such as the Be Pro Be Proud campaign that exposes young students to skilled trades could focus on the necessary outreach to these communities. A broader applicant pipeline funneling into local training programs can create a higher number of graduates entering the workforce.

### Potential Supply from Existing Training Programs

Currently, NTI has the capacity to graduate 21 students each year. NTI explained their supply of quality candidates is not adequate for them to admit the maximum number of students. Several applicants lack the basic mechanical experience necessary to succeed in the program. Even if NTI began operating at capacity, training an additional nine diesel technicians each year, the annual supply shortage in the region would still be about 40 workers. **The biggest barrier to increasing training capacity at NTI is physical space.** NTI noted that space is 'very tight' at their training facility.

### Efforts by State Trade Association

The Arkansas Trucking Association has been very focused on auditing all training programs in the state. The association is pushing for all the training programs to get National Automotive Technicians Education Foundation (NATEF) certified. One of their biggest concerns is what they perceive to be a disconnect between a rapidly changing job and out-dated curriculum. Instructors across the state are teaching what they know and what used to be important, but are not up to date. They suggested that all instructors be required to regularly be recertified through continuing education. There are emerging curriculum platforms that need to be incorporated and continuously updated.

A recent Arkansas Truckers Association audit of NTI found that there was unused and outdated equipment, stored at the facility, taking up valuable space. NTI also noted that if they were to expand, finding qualified instructors could be an issue. Addressing the external and internal barriers limiting NTI's growth will be a crucial element to tackling the supply gap, but will require financial and equipment resources.

There is also evidence that NTI's program may need to be accelerated. As previously noted, the Northwest Arkansas market has a high proportion of diesel employers in the corporate fleet business. These businesses disclosed in interviews that diesel technicians working on their fleet focus on preventive maintenance and may not even touch the truck's engine. With these needs, companies are poaching NTI's students before they reach the advanced portions of the training program. Other trade schools, like the Francis Tuttle Diesel Technology School in Oklahoma, offer tiered training (*shown below*). NTI could offer a quicker preventive maintenance certification so some technicians can be sent to the fleet workforce quickly.

### Francis Tuttle Diesel Program Tiers

Major	Full-Time Program Length
Medium/Heavy Diesel Preventative Maintenance Technician	3 months
Medium/Heavy Diesel Truck Engine Technician	4 months
Medium/Heavy Diesel Truck Service and Light Repair Technician	7 months
Medium/Heavy Diesel Service Technician	9 months
Medium/Heavy Diesel Service Technician/CDL Class B	10 months

Source: Francis Tuttle (2017)

### Potential Supply in Public Education

As the region and state look to address their supply gap in diesel technicians the recruitment pipeline will likely need to move beyond the non-traditional adult student. Students already within the public education system offer a larger pool of untapped talent.

### Graduation Rates in Springdale and Arkansas, 2016

Student Group	Springdale School District	Arkansas
Hispanic	87%	86%
Native American	80%	87%
Asian	93%	91%
African American	86%	82%
Hawaiian/ Pacific Islander	75%	75%
White	89%	89%
Migrant	64%	82%
Economic Disadvantage	85%	84%
<b>Overall</b>	<b>87%</b>	<b>87%</b>

Source: Arkansas Department of Education (2017)

Despite the heavy promotion from school administrators and guidance counselors not all students continue onto a postsecondary education. Some students who struggle with traditional learning models may not even make it past high school. In the Springdale school district over 87 percent of students graduated high school in 2016. Given enrollment levels this means that about 235 students are not successful under the traditional high school education. Graduation rates are lower for those who are

economically disadvantaged, a rate of 85 percent. In 2016, Springdale's district saw 156 economically disadvantaged students fail to graduate high school.

In Arkansas, the overall graduation rate is also about 87 percent. Over 5,300 students did not graduate high school in the state in 2016, two-thirds of whom were classified as economically disadvantaged. For students who do graduate from high school, at least one-fourth will start their careers and not pursue a postsecondary degree. Administrators in the Springdale School District estimate that on average 22 percent do not go onto further education. At the state level, according to National Center for Education Statistics data, about 33 percent of students who graduate from high school do not enroll in any postsecondary education. This population represents an opportunity to train for diesel technology before they leave high school.

### Potential Workforce Supply in Public Education, 2016

Student Group	Springdale School District	Arkansas
Did not graduate high school	235	5,300
Graduated, but no further education	350	11,730
<b>Total Potential Supply</b>	<b>585</b>	<b>17,030</b>

Source: EL calculations based on Arkansas Department of Education (2017)

### Public Technical Education

For those who struggle with 'book learning' of high school or are not pursuing a college education, career and technical courses (CTE) offer a chance to gain hands-on experience for a specific career track. **According to the US Department of Education, students who concentrate on CTE are more likely to graduate by 21 percentage points to comparable non-CTE students.** State data compiled by the Arkansas Bureau of Legislative Research shows similar results. During the 2014-2015 school year, 97 percent of Arkansas' CTE concentrators graduated high school. After graduation 92 percent of CTE students in the state went out to employment, military, or postsecondary education.

CTE enrollment in Arkansas is strong, students who have completed a CTE track account for about 43 percent of all high graduates. During the 2015-16 school year, 45 percent of Arkansas school districts had a Transportation, Distribution and Logistics CTE program. However most of the CTE program completions across the state are in human services and agriculture. During the 2014-2015 school year only 410 students completed the Transportation, Distribution and Logistics track, about 2 percent of total CTE completions.

The majority of CTE funding in Arkansas is not focused on developing skilled trade careers. Office skills, home economics, and agriculture programs account for 70 percent of CTE expenditures. Trade and Industrial programs accounted for 11 percent of the spending.

The state has a strong CTE infrastructure but the focus is not on trade or industrial skills. The focus on diesel programs is even more sparse. Specific diesel technician programs were offered in just eight school districts across the state in 2016. For the over 17,000 in the state starting their career before or after high school, career education in public schools could better focus on the trades, such as diesel technicians, that offer students higher compensation and strong demand. Most CTE courses teach basic

skills and serve as an exposure to a career, a good foundation, but with the supply gap looming large for diesel technicians these programs need to also move towards career readiness and certification.

### Diesel Technician Supply and Demand SWOT Analysis

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>• High concentration of diesel technicians</li> <li>• Wages are the highest among skilled trades</li> <li>• Sustained growth</li> </ul>	<ul style="list-style-type: none"> <li>• Aging workforce</li> <li>• Multiple stakeholders to train for with corporate fleets and automotive services</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>• Potential to expand the labor pool to women and minorities</li> <li>• Most young students will have technology background required for today's diesel technician</li> </ul>	<ul style="list-style-type: none"> <li>• Supply gap could limit regional companies' potential for growth</li> <li>• Higher investment in recruiting and training can impact company resources and profit</li> </ul>

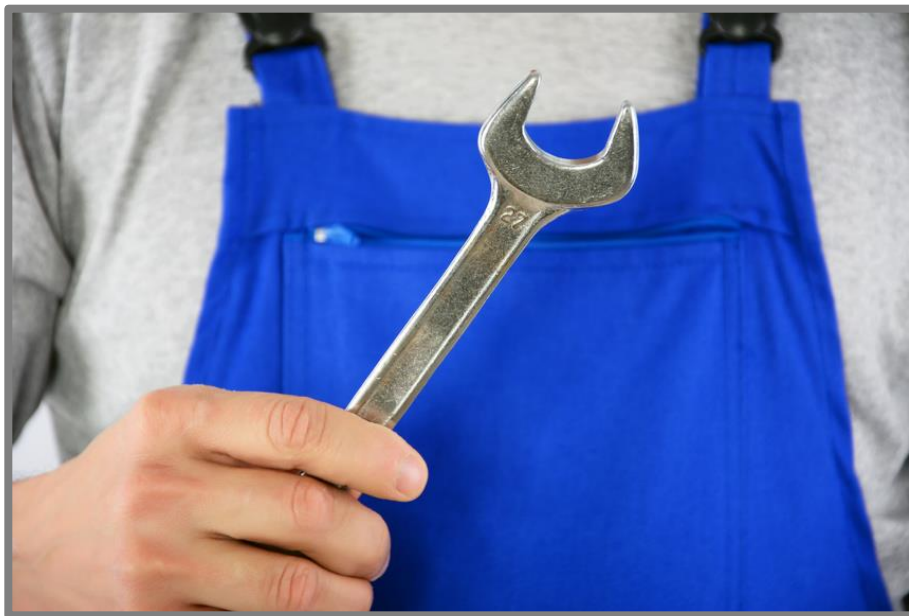
## Part IV – The Drive to Public Education

Public education represents the largest potential supply for training the next generation in the skilled trades and specifically for jobs as diesel technicians. Other regions across the country have recognized this and begun to focus their diesel training efforts towards this population. This section reviews successful programs across the country and the necessary components of a training program based on interviews with local stakeholders.

### Components of a Successful Training Program

Most of the employers interviewed stressed that starting training earlier was necessary, and that a systematic change needs to happen in the K-12 education system. The insistence that success must include graduating with a four-year degree was bemoaned by local stakeholders as a limited view and not a practical plan for all students. **The general view was that students, schools, and parents do not have any career pathway vision beyond getting students accepted into a 4-year college.** This narrative must change to ensure that any training program is able to recruit students.

The lack of information is a problem. Parents are not aware of the opportunities that exist for people without a four-year degree. To get people interested in trucking and diesel mechanic careers the group felt that more work is needed to target the influencers of young people, specifically parents, teachers, guidance counsellors and community leaders. In general, interviewees felt the opportunities and high demand of the diesel technician and other skilled trade positions had not been communicated to the community.



The lack of interest in pursuing mechanical fields was blamed, in part, on an absence of aptitude testing and the removal of shop and other vocational classes in the public education system. Local hirers agreed that exposure to these types of occupations needs to start as early as middle school to impact a student's career trajectory. Guidance counsellors should help students assess their abilities, including mechanical aptitude, and guiding students toward classes that harness those skills.

There is also an opportunity to adjust the traditional subjects of English and Math to match a technical career. One technician interviewed gave the following aspirational example: say that a student struggled writing about Shakespeare, but in a technical writing course the student's writing was focused on drafting coherent work orders for clients. **Focusing writing and other traditional educational skills through the lens of technical job requirements may facilitate learning in students with mechanical aptitude.**

## Hard Skills Required

When local employers were questioned about which hard skills that were most valuable, they mentioned that diesel students need to have a broad mechanical experience beyond truck-specific work. These companies have seen new hires that passed online diesel classes with flying colors, but

### Student and Parent Engagement

The Young Manufacturers Academy is a summer camp for middle school aged students that exposes them to the machines and processes used in advanced manufacturing. For example, the camp included a field trip to a local company as well as the students creating figures on a 3D printer. A survey was conducted at the beginning and end of the program for students and parents.

The feedback from the surveys conveyed that the students had a positive experience and enjoyed the exposure to these skilled trades. Although given their enthusiasm for the program, students seemed less likely to seek out more information on their own despite a strong agreement with the statement, “I’d like to learn more about manufacturing.” Most notably, one of the highest scoring statements by parents after camp completion was “I feel good about manufacturing careers.” Both students and parents surveyed were still not as informed on educational pathways for manufacturing careers once the camp was completed.

The academy demonstrates that exposure to skilled trades can better inform students and parents. However, any exposure programs must also focus on demonstrating the educational pathways available so students can easily continue a skilled trades path after exposure and education.

struggled to solve actual problems in the shop. They mentioned that kids who had grown up tinkering with lawnmowers, cars, and other equipment are most likely to be able to pick up the skills of the trade. **However, increasingly today, children are not exposed to mechanical experiences and as one technician put it, “Kids don’t even know what a wrench is.”** This lack of general mechanical aptitude is a contributing factor to NTI from training more technicians.

Beyond the mechanical aspects of the job, **according to the interviewees, 30 percent of the job is computer oriented**, done on a laptop. This percentage is only expected to increase as more semi-autonomous features are expected to be placed in trucks. Therefore, technology savvy individuals are desired. Many companies noted that their older workforce struggles with this computer based work. Companies look to younger people to have this experience, but according to several hirers, it often comes at the expense of mechanical expertise. This chasm between technology and trade-based skills in the education system has created a two-tiered applicant pool. As one frustrated technician put it, “Computer kids don’t want to get dirty.” The marketing of STEM career pathways must also include mechanical skilled trades and not solely coding at a desk.

## Soft Skills Required

While the companies interviewed would prefer an applicant with hard skills already in hand, they are more willing to be flexible on those measures than their soft skill requirements. Finding applicants with the desired soft skills was the most frequently mentioned frustration expressed by the companies interviewed. **Companies are struggling most with finding employees who are disciplined enough to arrive on-time to work and can pass a drug test.** Many of these struggles are with the expanding millennial workforce. The trucking industry is tied to deadlines and those constraints are not meshing with new recruits.

Finding employees who could focus and commit to the realities of the job for an entire shift was also a struggle. Young trainees need to learn to focus on the work in front of them and avoid distractions from their phone throughout the workday. The intensity of the soft skill lamentations of these companies highlights the fact that any training solution must mimic workplace realities and instill teamwork and leadership qualities.

### On-The-Job Experience

On average, companies in the region required six months to one year of diesel repair shop experience on their job postings. Under current shortage conditions these companies are forced to accept applicants who do not have any experience in the field. When it comes to internship requirements, local companies indicated that they are willing to train anyone who has an interest in the trade and some mechanical aptitude. Or as one seasoned technician put it, “Give me someone who knows how to use a wrench and I can train them.”

**“Give me someone who knows how to use a wrench and I can train them.”**

from Industry interview

One logistical problem with students gaining exposure to the job is with insurance liability. **Currently, employers are not allowed to have anyone in their shop who is under 18 years old, due to their insurance policies.** Understandably, there are serious safety concerns when young people are around big, powerful machines. This insurance barrier however is blocking true job exposure and the potential for internships for students in high school or younger. This means educational programs targeting K-12 students must rely on simulations and discussing the job in the abstract. The State of Georgia has recently passed legislation discounting workers’ compensation insurance premiums for companies willing to take on high school interns. This demonstrates that policy makers in Arkansas could play a role in removing some of these limitations.

### Industrial Differences

The needs of diesel technician training varied based on the industry of the hiring company. Interviews revealed differences between the needs for dealerships and corporate fleets. Working as a diesel mechanic for a corporate fleet, much of the work is focused on preventive maintenance. The incentive is to keep the trucks from requiring costly repairs in the future and to be able to keep material moving efficiently. **In fact, many of the technicians from corporate fleets wished that preventive maintenance was emphasized more in training rather than repair.** The extent of repair conducted in corporate fleets also varied by company. Some corporate fleets said their technicians may not even touch the internal engine as the more technical engine work gets outsourced when issues arise.

The dealership model is usually much different than fleet and maintenance work. Diesel technicians work on a flat-rate basis. This type of pay schedule can be tough for new hires. Dealership work also focuses on more specialized and technical skills, as some of the hardest repairs are sent to them. Dealership work can result in higher pay for the technician but the work is often at an accelerated, difficult pace.

### Case Studies

For years, the training for diesel technicians has relied on the individual to have interest and attend classes at community college or technical school. As the nation deals with the shortage in qualified applicants other training models have been developed. The high school partnership and the technology/early-college high school model are reviewed to show their connections with local companies and training pathways.

## High School and Community College Partnerships

### Utah Diesel Technician Pathways – Salt Lake City, Utah

To deal with a shortage of diesel mechanics under a tight labor market with low unemployment, the Utah Governor's Economic Development Office developed a pathway to connect students from several Salt Lake City school districts with an existing community college diesel technician-training program. The program strives to have the students be fully capable diesel technicians in five years. The student will graduate from their regular high school after taking a variety of technical classes. Next, the students complete a paid internship with one of the six local industry partners. The industry partners are expected to provide the school districts with the most up-to-date technology for their students to train on. They will also provide the students an opportunity to train as an intern and to interview for employment upon program completion. After this internship, the student completes at least one year of training at the Salt Lake Community College diesel facility. Many of the students are expected to have jobs guaranteed for them before, and contingent on, finishing their technical training at the community college.

Currently the program, in its pilot phase, has two school districts involved, with the hope to expand access to all the school districts in Salt Lake City. A few of the high schools already had diesel technician coursework, but they joined the public-private collaboration and fully aligned their programs with the pathway. The total program costs are estimated to be about \$3,100 for the student. The pilot program began in the 2016 school year.

### Partnership Training Pros and Cons

Pros	Cons
<ul style="list-style-type: none"><li>• Paid internships create incentive for students and bridge connection to local companies</li></ul>	<ul style="list-style-type: none"><li>• Still requires 1 or 2 years of postsecondary education</li></ul>
<ul style="list-style-type: none"><li>• Collaborations between stakeholders</li></ul>	<ul style="list-style-type: none"><li>• General education of student remains the same, including lack of workplace protocol training</li></ul>
<ul style="list-style-type: none"><li>• Ability to reach multiple school districts</li></ul>	<ul style="list-style-type: none"><li>• Requires students to leave their high school and travel to community colleges</li></ul>

## Technical / Early College High Schools

### Dr. James A. Forrest Career and Technology Center (FCTC) – St. Mary's County, MD

This technology center offers 24 different career programs, including diesel technology, to all high school students in St. Mary's County school district. Currently the technology center has more than 1,000 students enrolled at FCTC, about one-fifth of all students in the district. The programs are either two or three-year programs. The diesel technology program is a three-year program. Students graduate with a high school diploma as well as college credits and/or industry certifications. Students are bused from

their home high school, where they take their general education courses, to the FCTC for their specialized classes.

To prepare students to enter the workforce, the FCTC provides resources in resume writing so that each student has an official resume specific to their field ready before they graduate. The FCTC also hosts a mock interview fair where local professionals volunteer to conduct interviews with students and afterwards provide productive feedback. To recruit students to the FCTC, 8<sup>th</sup> graders who are struggling in middle school are offered a program called “Tech Connect.” This effort brings the middle school students to the center and exposes them to the offerings available at FCTC as they progress to high school.

### **Gentry Charter School – Gentry, Arkansas**

In the far west corner of the Northwest Arkansas region, there is a high school based diesel technology-training program that is in its beginning phases. The former Gentry High School has been converted to a charter school. The goal of the Gentry Career & Technical Education Center is to prepare students for a career and college. The charter school's goal is by 2022 for over 60 percent of graduating seniors to meet ACT standards for both college and workforce readiness. Enrollment is currently available to any high school student in the Gentry and Gravette school districts. At capacity, the school will be able to support a maximum of 500 students. The school offers three career tracks for students in the healthcare, information technology, and transportation fields. The transportation program currently focuses specifically on diesel technician skills.

For the diesel program, obtaining ASE industry certificates will be the focus of the pathway. Requiring students to maintain their “employee badge” and clocking in on time is reinforcing soft skills. The school received a waiver so that industry workers can teach career classes without a teaching certificate. According to the superintendent, Judy Winslett, who noted at a public meeting that this waiver helps them with the diesel program because, “it would be extremely difficult and highly unlikely to find a diesel mechanic instructor with a teaching license willing to be paid from the teacher salary schedule.”

Based on review committee documents this is the anticipated annual budget for the diesel program:



*Policy makers and school personnel admire a five-ton crane in the newly opened diesel technology lab at the Gentry Career and Technical Education Center.*

Source: Northwest Arkansas Democrat-Gazette (2017)

- o Instructional staff - \$40,000
- o Material and supplies - \$2,500
- o Equipment, if applicable \$92,830
- o Textbooks/Resource material - \$3,500

The school just recently held the ribbon cutting ceremony for their new building in August 2017. Before this the diesel students were working out of a bus garage. The lab contains classrooms and two truck bays. The new \$2 million facility was in part funded by a property tax rate increase. The millage increase was approved by the town's voters in a special election.

### **Wilson Academy of Applied Technology – Wilson, NC**

While not offering a specific diesel mechanic focus, the Wilson Academy of Applied Technology (WAAT) in North Carolina is a unique example of a partnership between industry leaders, community colleges, and a K-12 public school system. WAAT was developed to address an expressed need for advanced manufacturing workers at local companies. WAAT is a five-year early college high school, where students will graduate with a high school diploma and an associate's degree. The cost is free to students who sign a contract to complete the five-year program. Students will typically spend their first three years of the program at the new high school site and the remaining two primarily at the local community college.

The school began its first year with a freshman class of 75 students. In the school's second year there are 95 students enrolled. Students were recruited from the area's six middle schools through "STEM Days" which introduced students to the careers available in manufacturing and attempted to shift student and family mindsets about skilled trades. The main selling point of WAAT is that it allows students - by the age of 18 or 19 - to obtain an associate's degree and be ready for a high-paying skilled manufacturing job with zero debt. WAAT staff believes that its graduates will have a three-year advantage over the average student coming out of high school.

The difference between WAAT and a general connection between a high school and a community college is that all the education occurs through the lens of advanced manufacturing. Even general education courses, like math and English, will be taught through manufacturing examples and experience. The timeline for the curriculum is as follows:

#### **9<sup>th</sup> Grade – Introduction to Manufacturing**

##### **Focus Points:**

- Introducing students to opportunities at local advanced manufacturing facilities
- Understanding of expectations of advanced manufacturing careers
- Soft skills and technical skills necessary for workforce readiness in any field

#### **10<sup>th</sup> Grade – Career Exploration**

##### **Focus Points:**

- Deeper understanding of different career pathways
- Students refine their area of interest by the end of this school year
- Soft skills and technical skills necessary for workforce readiness in any field

#### **11<sup>th</sup> Grade – Career Preparation**

##### **Focus Points:**

- Job shadowing
- Interactions with industry professionals in their chosen field
- Students can exemplify workplace culture and protocol

#### **12<sup>th</sup> Grade – Workforce Development**

##### **Focus Points:**

- Technical training with industrial equipment
- Training conducted on the specific technology of local firms
- Students are ready for role of an employee

## 13<sup>th</sup> Grade – Career Training

### Focus Points:

- Students participate in internships
- Students exhibit mastery in the skills of their chosen pathway
- Students network to obtain a career in their field

Workplace culture and leadership skills are a vital focus of the curriculum at WAAT. The school conducts performance reviews with each student twice a semester. It was the industry leaders from the advisory board who suggested this program to simulate the workplace experience. WAAT also utilizes a badge system where students must maintain their badge to enter and leave each class. Each week there is an assembly where mentors speak to the students on essential skills. The curriculum also includes industry standard information such as OSHA requirements and the Good Manufacturing Practices (GMP).

## Technical/ Early College High School Training Pros and Cons

Pros	Cons
<ul style="list-style-type: none"><li>• Workplace soft skills are priority focus of curriculum</li></ul>	<ul style="list-style-type: none"><li>• Requires large investments from companies, state, school system, and other partners</li></ul>
<ul style="list-style-type: none"><li>• Strong collaborations between stakeholders, particularly business input into curriculum</li></ul>	<ul style="list-style-type: none"><li>• Special education permits and chartering required</li></ul>
<ul style="list-style-type: none"><li>• Free public-school education</li></ul>	<ul style="list-style-type: none"><li>• Newer concept with limited proven results</li></ul>
<ul style="list-style-type: none"><li>• General education delivered in practical industry context</li></ul>	

### The Tyson School of Innovation

The Tyson School of Innovation (SOI) in Springdale, AR is a charter high school that focuses specifically on STEM and trade skills. The demographic make-up of the SOI is about 60 percent of students below poverty levels, 35 percent of students are Hispanic, and the school has a gender ratio of 50/50 female to male. The SOI just started a few years ago and has not yet had its first class of graduates.

SOI focuses on bringing in local companies to teach students about local opportunities in careers they might not be exposed to otherwise. They also measure the students on soft skills and executive leadership skills, on their report cards alongside their academic grades. Many employers in the region are excited about the SOI reaching students in high school and their approach to technical hard skills as well as soft skills. Given the SOI's age, it is too early to tell how effective their strategy will be.

The SOI has an educational structure that meets many of the requests of local employers, such as soft skill training. With a few years of operation under its belt and a strategic location in the NW Arkansas region, the SOI may be best suited to build a high school based diesel technology program. NTI and the SOI are currently collaborating on a secondary school diesel technician-training program to reach kids

at a younger age. A project that was more formal with support from the state and local companies could bridge the gap between supply and demand.

**Takeaways:**

- The training pipeline needs to be expanded to reach middle and high school students.
- Soft skills and workplace etiquette must be a part of any training program.
- There must be a cultural shift in the K-12 system.
- Recruitment, exposure, and aptitude strategies that guide towards skilled trades need to begin when the students are young.
- General education can be taught through the lens of diesel technology.
- Insurance liabilities are preventing younger students from getting hands-on exposure to the trade.

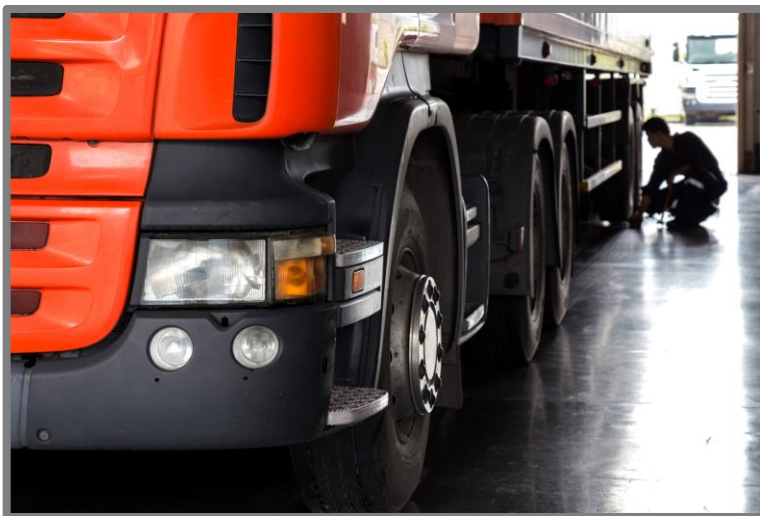
## Part V – Garnering Support from Original Equipment Manufacturers and Local Employers

For many years companies have relied on traditional programs at technical schools and community colleges to supply their talent for diesel technicians. As the nationwide shortage of diesel technicians has grown, communities are being forced to develop different strategies, bringing all stakeholders together to create new partnerships. Many of these high school or high school/community college partnership programs are relatively new and expensive endeavors. A major upfront cost for diesel technician training is the diesel truck and engine equipment used for instruction. This section addresses the ways in which training programs can partner with the original equipment manufacturers (OEMs) of these products to trade access to equipment for access to students. Cooperation opportunities between local employers and training programs is also discussed.

### Interest in Contributing to Training New Technicians

The local companies interviewed, faced with limited qualified applicants, are already investing unilaterally to meet their workforce needs. Training technicians themselves is already draining the company's finances, staff, and equipment. Many hiring companies are begging for a united solution to the diesel technician shortage. Interest in contributing to a training program varied by size of employer and would depend on what they would receive in return.

Companies stressed that any contribution on their end would need to include a guarantee that trainees are going to be trained specifically for their needs. **“Will the students be working on the brand of trucks that are used in their fleet?”** was a common follow-up question after hirers were asked about their willingness to commit resources. Currently, some companies are shipping their diesel technicians out of state to learn from training programs that are specifically adapted for the OEM brand of truck that their fleet is using.



Companies will be self-interested donors to a program. They are willing to lend their branding for special access to the students. However, it would be difficult to meet the precise demands of each major employer. **The essential question of a training program will be “What is the best way to make every contributing company satisfied and engaged?”** The following programs around the country offer some examples of ways to partner with local employers and OEMs.

### Oklahoma State University – CAT® Dealer Prep Program

Many of the truck OEMs need high-quality diesel technicians who are trained specifically on their brand to staff their dealership across the country. Oklahoma State University offers students a specific CAT dealership focused associate's degree program. Over the two-year program about half of instruction time is spent at a sponsoring CAT dealership. Classroom time is immediately reinforced with hands-on learning at the CAT dealership. The sponsoring dealership then provides a paid internship to students and also serves on the advisory committee for the university's training program. The OEM agrees to these contributions because it can guarantee that the classroom time is focused on CAT trucks and diagnostic procedures. Students are also adding value to the dealership through their work even before classroom training is complete.

### **Lincoln College of Technology**

The Lincoln College of Technology, or Lincoln Tech, is a private trade school with locations across the country focusing on recent high school graduates and working adults. Lincoln Tech's training model is based on partnerships with OEMs. At the Nashville campus, the automotive shop partnered with Audi of America to give students exclusive access to Audi vehicles to train on the most up-to-date technology. The Lincoln Tech program offers courses on Audi-specific technology and a certification in Audi Maintenance and Light Repair. Audi also conducts exclusive career fairs on campus. This symbiotic relationship provides the school with the best training tools and Audi with the opportunity to have applicants already trained on their current systems.

### **Wilson Academy of Applied Technology – Wilson, NC**

Financing and equipment provided by local companies were crucial for this early college high school to get up and running. In exchange for their funding and in-kind contributions, leaders in local industries serve on an advisory board for the school. The 16 local manufacturing companies provide input to ensure that the curriculum is relevant and current. The public-school system, local community college, local politicians, and the county economic development group are also represented on the advisory board. The companies also provide job shadowing and internships to students. This gives companies an opportunity to have trial periods and know what type of worker they will receive if they offer the student a full-time job.

### **Gentry Charter School – Gentry, Arkansas**

McKee Foods Corporation, based locally, is the marquee sponsor for this training program and supports the school with finances and equipment. The company gifted the program a Volvo semi-tractor.

**Knowing that the school is instructing its students on the exact equipment that is used in their shop is a benefit so great it is worth the donation of one of their own trucks.** The company also helped by providing teachers to the school, this assures McKee Foods that the curriculum will be up-to-date and relevant to their operation.

### **Francis Tuttle Technology Center - Oklahoma City, OK**

Francis Tuttle is a technology education center partnered with the Oklahoma Department of Career and Technology Education. Snap-on, a manufacturer of high-end professional tools, is the premier sponsor of the school. The school, in return, offers Snap-on certifications to students. Each student of Francis Tuttle graduates with a certificate in using Snap-on's digital volt/ohm meter. The training facility has three classrooms for instruction. These classrooms are also offered to local companies to use for their own company-specific training.



*The 36,000-square foot diesel technology training center in Reno, Oklahoma is a result of partnerships between a public trade school and several large local employers. Source: CMS Willowbrook*

## Part VI - Recommendations

After collecting data and speaking with stakeholders, we have confirmed the skills gap and labor shortage in the region for diesel technicians. **The magnitude of the demand is approximately 40-50 new technicians that need to be trained each year.** NTI's diesel technology program is currently only able to meet less than half of the training needs. NW Arkansas is not alone in its struggle to find and train individuals for skilled trades the same problems ail the state economy. To frame the recommendations, reports from the Harvard Business School and EMSI were reviewed for best practices in addressing gaps in skilled trades. Cooperation between companies, policy makers, and educators will be needed to successfully address the shortage. A broader, multi-action approach focusing on a long-term strategy is also crucial. Multiple stakeholders must commit to their part of the solution.

### Roles for Stakeholders

#### Companies

- Embrace training programs as an integral part of their supply chain, as they would a durable goods supplier.
- Invest in consistent communications with training programs.
- Support training programs with apprenticeships and internships.
- Sustain programs with funding and relevant equipment.

#### Policy Makers

- Offer real-time job market information to students, parents, educators, and companies.
- Identify and address regulatory impediments to innovation.
- Publicly support and work to change the rhetoric regarding skilled trades.
- Continuously engage all stakeholders.
- Establish strategic goals and consistently measure performance.

#### Educators

- Send staff to local businesses to understand needs.
- Certify teachers in industry standards.
- Become better educated on local job market data and relay this information to students and parents.
- Demonstrate skilled trade career pathways to students.
- Teach and enforce the soft skills that meet the standards of the workplace.

Source: Derived from *HBS Bridae the Gap: Rebuilding America's Middle Skills*

The research in this report also revealed a need for strategies that expanded the current pipeline of diesel technicians beyond adults enrolling in one trade school. The following phases from EMSI's 2017

*Talent Attraction Scorecard Report* demonstrate how policy makers can look to address talent gaps in the short and long term.

## Strategies for Building a Talent Pipeline

### Phase 1

Talent  
Attraction

#### 0 to 6 Month Strategy

Educational restructuring is a must, but can take years and will not address current gaps. Using big data and social media, economic developers and employers can work on recruitment using these connections:

- workers who grew up in the region,
- workers who have family in the region,
- alumni of high school and colleges of the region, or
- workers who could generate a pay increase due to cost of living.

### Phase 2

Transferable  
Skills

#### 6 Month – 2 Year Strategy

Identify individuals with similar skill sets that could transfer with minimal training to needed jobs. This can help shift workers from occupations that have seen reduction in demand to those in higher demand.

### Phase 3

Technical &  
Certificate  
Programs

#### 2 to 4 Year Strategy

Create a partnership between businesses, EDOs, workforce boards, industry associations, and education programs to address long-term talent pipeline growth.

### Phase 4

Advanced  
Skill Sets

#### 4 to 10 Year Strategy

Increase enrollment in the pipeline of middle skill jobs at the high school and junior high level. This includes:

- exposure to local opportunities,
- aptitude testing,
- parent engagement, and
- incorporate STEM and technical skills into general curriculum.

## Phase 5 Starting Early

### 10 to 15 Year Strategy

Expose elementary children to technology, science, and skilled trades. Connect computer skills with in-demand job opportunities. Help parents set the tone early for possible outcomes in the education system beyond four-year college.

Source: Derived from EMSI's 2017 *Talent Attraction Scorecard Report*

These general guidelines form the framework of recommendations to improve diesel technician recruitment and training in Northwest Arkansas. There were problems identified across the training platform. The current system in NW Arkansas has several specific problems: only a small number of students are entering the pipeline; the pool of candidates is constrained due to small numbers of minorities and women; training is limited by capacity at NTL; and entry-level barriers exist such as the need to self-fund a personal toolkit. These factors in combination are limiting the number of trained diesel technicians entering and staying in the workforce. The recommendations provided in this report are aimed at addressing the issues that persist across the training spectrum.



## The Diesel Technician Training Spectrum



### Pipeline Issues:

- Limited interest in profession
- Students do not understand and are not exposed to the nature of the job
- Students lack basic mechanical skills
- Parents and educators prefer college preparation and often steer students away from skilled careers
- Women are often discouraged from mechanical and technical fields
- Language barriers limit pipeline expansion

### Training Program Issues:

- Small facility size
- Lack of curriculum certification
- Outdated equipment and curriculum

### Workforce Issues:

- Students are poached from training programs before graduation
- Companies want graduates with specialized ASE certifications
- A new employee must fund their own tools
- Training needs vary depending upon industry of employer
- High turnover rate
- Entry-level workers struggle to see career long-term benefits
- Workers are poached from other local companies

Based on these needs, **we recommend creating a high school based diesel technician-training program.** Public education offers a large supply of students who will start their careers before or after graduating high school. Since the Tyson School of Innovation is already operating in grades 8<sup>th</sup>-12<sup>th</sup> with a focus on technical skills and workplace soft skills, it would be ideal to incorporate the diesel technology program into their existing infrastructure. The program would need a dedicated training lab able to house several trucks and classrooms. Students should graduate in four years with a diesel technician certification and a paid summer internship already lined up (or after they turn 18-years old). Upon successful completion of their internship the student would have the option to enter the field, earn an associate's degree in applied sciences, take advanced diesel classes at NTI, or continue to a four-year university. Our recommendations for this high school program are as follows:

## **1. Change the Rhetoric**

- Local economic development organizations and chambers of commerce should disseminate research on diesel technicians to companies and educators.
- Educators across the school system can be exposed to local needs and consistently review data on opportunities that exist locally for students.
- Educators should conduct field visits to local companies and become proponents of the high school program for the right students.
- Parents should be exposed to the career pathways available in skilled trades like diesel technology throughout their child's education.
- Create a public relations campaign that promotes that graduates of the diesel technology program will be debt-free, certified, and ready for the workforce as well as college.
- Engage local leaders in public service announcements about the value of skilled trades and specifically the demand for diesel technicians.

## **2. Expand the Pipeline**

- Expose young students to the diesel technician career through field trips, guest speakers, and simulation demonstrations. This could be accomplished with a skilled trade themed special event planned once a semester.
- Conduct aptitude testing in the first year of middle school to determine students who may have a mechanical or technical aptitude. Allow students who are well suited for the program to do site visits or come to open houses at the diesel technology center.
- Recruit and promote the diesel program to students of all genders and races.
- Focus on recruiting students who will be unlikely to pursue postsecondary education due to financial constraints.

## **3. Improve the Curriculum**

- Create an advisory board for the diesel technology program that includes all stakeholders including businesses, trade associations, public school administrators, local politicians, and economic developers.
- The curriculum should be driven by industry input based on their current and future needs, highlighting the emerging computer and technology aspects of the job.
- Incorporate soft skills training into educational programming. This may include an employee badge program, semester performance reviews, mock interviews, and leadership skill report cards.
- Seek NATEF certification for the diesel technology-training program.
- Focus early diesel training on preventive maintenance before focusing on engine repair.
- Lease equipment every few years for training to keep methods current with industry.

## **4. Partner with Local Companies**

- Reserve more than half of the spots on the curriculum advisory board for local companies.
- In return for input on the curriculum, seek funding and equipment leasing from local industry partners.
- Create paid internship program that offers on-the-job training to the diesel technology students as soon as they turn 18 years old.
- Allow supporting company's use of the diesel technology training center and classrooms for their own employee training.

- Certify students on technology specific to industry partners.
- Grant exclusive access to partnering companies through job fairs, speaking engagements, mock interviews, and guest teaching positions.
- Companies can offer to lend their employees as teachers on a consistent or one-time basis.
- Partner with tool equipment companies to offer heavy discount to students on their beginner toolkit upon graduation from the program.

NTI will still play an important role in the training process and must be given additional support and resources. It will still be necessary to quickly train adults looking to switch careers or who did not access the high school program. NTI can play a crucial role of retraining workers who may have lost their job but have skills transferrable to diesel technology. Depending upon resources, NTI and the SOI may need to partner to train the students from the high school program. The students of the high school program may need to travel to NTI for specific classes until a dedicated diesel-training lab can be built. If a dedicated lab with greater capacity is built for the high school program, it is recommended that NTI could partner to teach its adult programs at the lab in the evening.

The fact that companies are poaching NTI students before they graduate indicates there is a need for an accelerated program. We recommend that NTI create a tiered diesel technology education program, similar to the other trade schools featured in the case studies section of this report. Given that many of the large employers in the region are corporate fleets, NTI could better serve these companies by creating a preventive maintenance program that is shorter than their current 18-month program. For example, a 9-month program that focused on the needs of corporate fleet maintenance, could graduate students and send them out to the field with exactly what many corporate fleets need. The longer tiered program at NTI could focus on the specifics of engine repair and more specialized training required for dealership work. If NTI were to offer advanced dealership focused courses, it would need to partner with OEMs to assist with equipment and curriculum assistance.

#### **Recommendations for NTI:**

- Focus on adults and retraining efforts.
- Seek NATEF certification.
- Expand space or move into high school facility.
- Create connection with NTI's English-As-Second Language classes to offer ESL graduates further career opportunities through the diesel technology program.
- Lease equipment to continue to stay current with industry needs.
- Bring local companies in to train educators on the latest technology and processes on an annual basis, focusing on software and technology based skills.
- Add soft skills training that mimic the workplace environment, such as an employee badge program.
- Offer ASE test preparation classes to currently employed, older technicians so they can advance in their career. Companies may offer to sponsor or pay for such a training.
- Offer a "mechanical boot-camp" the summer before classes start to help open the program up to more students. This will help students meet baseline requirements before the diesel curriculum begins.

Finally, policy makers at the local and state level will be instrumental in the implementation of a high school diesel program in NW Arkansas. As noted in the Harvard Business School study, policy makers can best support middle skill workforce efforts by reducing barriers and providing financial support. Financial support from the state legislature will be necessary to meet the recommendation of leasing

equipment for the training center. By leasing current equipment and replacing every few years, the training program will be sustainable and up-to-date. Local policy makers will need to advocate for tax increases for the program, bring the stakeholders together, and ensure that goals are being met.

**Recommendations for Policy Makers:**

- Collect and disseminate data on diesel technology supply and demand.
- Provide funding for the construction of the diesel technology facility.
- Provide funding for the leasing of trucking equipment at NTI and SOI.
- Grant necessary special charter school education permits like allowing different pay scales for teachers provided by industry partners.
- Local representatives should participate in the school's advisory board.
- Vocally support the program and the emphasis on technical training at the high school level.
- Establish a process for measuring and evaluating the diesel technology program's performance once operational. Funding should be tied to performance data.
- Address the liability issues that prevent companies from allowing individuals under the age of 18 from entering their shop.

With consistent engagement from all stakeholders, we believe improvements can be made to all aspects of the recruitment and training spectrum. The region can address the local need of 40-50 new diesel technicians per year through a combined effort of increased training capacity at the high school and adult levels and a young student and parent education plan. Such an investment is critical for the future of the region's economy. Companies are now having to expend resources on training and recruitment. Under the right conditions, we believe they will come to the table and support a unified mission. There will be challenges implementing these recommendations such as balancing the needs of multiple industries and insurance policies that limit how students can gain experience. However, given the demand and the hardships the technician shortage has caused local companies, the case exists for implementing a new strategy in the region.

## Sources:

- Arkansas Bureau of Legislative Research. 2016. "Careers and Technical Education in Arkansas's K-12 Schools." [http://www.arkleg.state.ar.us/education/K12/AdequacyReports/2016/2016-07-19/03-Career%20and%20Technical%20Education%20Report,%20BLR%20\(43\).pdf](http://www.arkleg.state.ar.us/education/K12/AdequacyReports/2016/2016-07-19/03-Career%20and%20Technical%20Education%20Report,%20BLR%20(43).pdf)
- Arkansas Department of Education. 2017. "High School Graduation Rates." <https://adedatabeta.arkansas.gov>
- Arkansas Department of Education. 2016. "Gentry High School Carter- Charter Internal Review Committee Review and Applicant Responses." [http://www.arkansased.gov/public/userfiles/Learning\\_Services/Charter%20and%20Home%20School/Comments\\_and\\_Responses/Gentry\\_Charter\\_Request.pdf](http://www.arkansased.gov/public/userfiles/Learning_Services/Charter%20and%20Home%20School/Comments_and_Responses/Gentry_Charter_Request.pdf)
- Bureau of Labor Statistics. 2017. "Occupational Outlook Handbook, 2016-17 Edition, Diesel Service Technicians and Mechanics." <https://www.bls.gov/ooh/installation-maintenance-and-repair/diesel-service-technicians-and-mechanics.html>
- Channel 5 News Online. 2016. "Gentry to Build Diesel Technician Lab for High School." <http://5newsline.com/2016/09/22/gentry-to-build-diesel-technician-lab-for-high-school>
- Deseret News. 2016. "Diesel Technician Program Gives Students Path into Growing Career Field." <http://www.deseretnews.com/article/865646775/Diesel-technician-program-gives-students-path-into-growing-career-field.html>
- Economic Modeling Specialists International (EMSI). 2017. "EMSI Analyst Tool: Class of Worker 2017.3." <https://e.economicmodeling.com/analyst/?t=27j0v#h=77mYW&page=home>
- Economic Modeling Specialists International (EMSI). 2017. "2017 Talent Attraction Scorecard." <http://www.economicmodeling.com/talent-attraction-scorecard/>
- Harvard Business School. 2014. "Bridge the Gap: Rebuilding America's Middle Skills." <http://www.hbs.edu/competitiveness/research/Pages/research-details.aspx?rid=66>
- KUTV. 2016. "New Tech Training for Utah HS Students Aiming at 6-Figure Salaries." <http://kutv.com/news/local/new-tech-training-for-utah-hs-students-aiming-at-6-figure-salaries>
- Massachusetts Institute of Technology (MIT). 2017. "Living Wage Calculation for Fayetteville-Springdale-Rogers, AR." <http://livingwage.mit.edu/metros/22220>
- National Center for Education Statistics. 2016. "Estimate Rate of 2011-12 High School Graduates Attending Degree-Granting Postsecondary Institutions, by State: 2012." [https://nces.ed.gov/programs/digest/d15/tables/dt15\\_302.50.asp?current=yes](https://nces.ed.gov/programs/digest/d15/tables/dt15_302.50.asp?current=yes)
- Northwest Arkansas Democrat-Gazette. 2017. "Gentry Project a Model for State, Governor Says." <http://www.nwaonline.com/news/2017/aug/09/gentry-project-a-model-for-state-govern>
- Oklahoma State University. 2017. "Information Guide: CAT ® Dealer Prep Program." [http://go.osuit.edu/academics/diesel\\_heavy/cat/sites/go.osuit.edu/academics/diesel\\_heavy/cat/files/u126/CAT%20Information%20Guide%20201623-176.pdf](http://go.osuit.edu/academics/diesel_heavy/cat/sites/go.osuit.edu/academics/diesel_heavy/cat/files/u126/CAT%20Information%20Guide%20201623-176.pdf)
- PR Newswire. 2016. "Lincoln Tech Partners with Matco Tools to Supply Students with Professional Tool Kits." <http://www.prnewswire.com/news-releases/lincoln-tech-partners-with-matco-tools-to-supply-students-with-professional-tool-kits-300249914.html>

Study.com. 2017. "How to Become a Diesel Mechanic: Education and Career Roadmap. "

[http://study.com/articles/How\\_to\\_Become\\_a\\_Diesel\\_Mechanic\\_Education\\_and\\_Career\\_Roadmap.html](http://study.com/articles/How_to_Become_a_Diesel_Mechanic_Education_and_Career_Roadmap.html)

Tax Foundation. 2016. "The Real Value of \$100 in Each State." <https://taxfoundation.org/real-value-100-each-state-2016/>

The Bay Net. 2017. "Tech Center Gives High School Students Career Jump Starts."

<http://www.thebaynet.com/articles/0217/techcentergiveshighschoolstudentscareerjumpstarts.html>

Wilson County School System. 2017. "Wilson Academy of Applied Technology"

<http://appliedtechnology.nc.wce.schoolinsites.com>

## Appendix: Job Posting Analytics for Diesel Technicians

All the following data is based on job postings in Northwest Arkansas from January 2012 to January 2017.

### Geographic Posting Breakdown

County	Unique Postings
Washington County, AR	848
Benton County, AR	604
Carroll County, AR	28
Madison County, AR	5

Source: EMSI 2017.3

### Average Postings vs. Hires

Average Monthly Postings	Average Monthly Hires
24	36

Source: EMSI 2017.3

### Top Job Postings by Company

Company	Total	Unique
Ryder System, Inc.	1,185	215
Wal-Mart Stores, Inc.	2,205	254
J.B. Hunt Transport Services, Inc.	762	146
Republic Services, Inc.	720	112
Penske Truck Leasing Co., L.P.	424	90
Tyson Foods, Inc.	1,317	74
Great Dane Trailers, Inc.	357	84
Waste Management, Inc.	266	58
Pepsico, Inc.	162	34
Oldcastle Inc.	77	27
Briggs Equipment, Inc.	51	24
Comcar Industries, Inc.	92	23
Ruan Transport Corporation	48	18
SALMON LIMITED	52	18
University of Arkansas	60	17
Army National Guard	159	16
Staffmark Investment LLC	35	14
H&E Equipment Services, Inc.	24	12
Worksource Inc	31	12
Kelly Services, Inc.	51	11
P.A.M. Transportation Services, Inc.	45	11

Source: EMSI 2017.3

## Top Hiring Cities

City	Total	Unique
Springdale, AR	4,266	621
Lowell, AR	1,276	260
Bentonville, AR	1,150	150
Bella Vista, AR	778	123
Fayetteville, AR	477	108
Tontitown, AR	143	59
Rogers, AR	199	47
Elm Springs, AR	111	28
Green Forest, AR	56	20
Baldwin, AR	35	14
Lincoln, AR	148	10
Bethel Heights, AR	22	8
Eureka Springs, AR	18	8
Siloam Springs, AR	53	7
Gentry, AR	25	5
Greenland, AR	42	3

Source: EMSI 2017.3

## Top Hard Skills Listed

Skill	Postings with Skill
Repairing (Computer Systems)	935
Maintenance	560
Mechanics	474
Driving	385
Brakes	382
Engines	360
Motor Engine	357
Suspension (Vehicle)	311
Testing	297
Steering	294
Oil and Gas	291
Trailers	279
Electrical Systems	262
Chassis	258

Source: EMSI 2017.3

## Top Soft Skills Listed

Skill	Postings with Skill
Scheduling (Project Management)	128
Leading	88
Listening	38
Leadership	34
Learning	13
Reliability	12
Ethics	9
Literacy	3
Cleanliness	2

Source: EMSI 2017.3