

Recruitment and Retention of Highway Maintenance Workers

Final Report: Appendix

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August 2021

Prepared for Clear Roads and Minnesota DOT

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APPENDIX A – LITERATURE REVIEW SUMMARY

Challenges

Overview

Transformation of the Roadway Maintenance Operations Workforce

Citation: Bergner, D. 2019. *Transformation of the Roadway Maintenance Operations Workforce*. TRB, Whitepaper, Washington, D.C.

Link: <http://onlinepubs.trb.org/onlinepubs/centennial/papers/AHD15-Final.pdf>

Keywords: Critical Issues, Recruitment, Retention

The roadway maintenance operations workforce is currently undergoing major evolutions, from “shovel and truck” to highly skilled workers who need to understand complex machinery, work management systems, advanced communications, and various materials and their impacts. Additionally, agencies are making changes to require more training, performance-based pay and promotions, and increasing benefits. With all these changes, agencies have struggled to recruit and retain skilled employees. As more people begin to retire and as agencies increasingly have to compete with the private sector, state DOTs face many challenges when it comes to recruiting and retaining skilled employees.

The maintenance and operations workforce needs should be redefined or “rebranded” in order to attract younger and more diverse individuals into the sector.

TRB Critical Issues Faced by Maintenance and Operations (M&O) include:

- An increasing need to maintain pavement markings, traffic signs, signals, etc. in order to keep roadways safe for transformational technologies like connected and autonomous vehicles (C/AVs).
- M&O personnel are often involved before, during, and after an event to ensure safety and efficiency of the roadways but do not receive recognition for acting as “first responders” to major emergency incidents like extreme weather and other natural disasters. Department of Homeland Security (DHS) has designated public works as a component of the emergency services sector but M&O personnel must obtain Federal Emergency Management Association (FEMA) training to be recognized and accepted by other first responders.
- Due to an increasing backlog of maintenance, agencies must stretch limited funding for routine maintenance. Agencies have had success with data-driven maintenance and preservation decision-making, but these require training programs to build trust and buy-in from field personnel.
- Agencies face challenges recruiting and retaining employees. Agencies should focus on attracting a diverse workforce and building career pathways, but are often faced with a lack of time, funding, skills, and resources to do so. Some agencies have begun to outsource, but management problems arise with larger scale outsourcing of operations.

There is a need to examine the changes occurring within the M&O sector, including changes to job descriptions and requirements, classifications, pay scale, training, advancement, recruitment, etc.

Finding the Future Workforce for State DOTs Becoming Tougher

Citation: AASHTO, 2018. *Finding the Future Workforce for State DOTs Becoming Tougher*. AASHTO Journal, Aug. 17, 2018.

Link: <https://aashtojournal.org/2018/08/17/finding-the-future-workforce-for-state-dots-becoming-tougher/>

Keywords: Overview, Workforce, State DOTs

With unemployment hitting a low and an increase in Baby Boomers retiring, state DOTs are struggling to recruit and retain skilled employees. With an increasing number of employees eligible for retirement there is also a concern of losing highly knowledgeable employees. Washington State Department of Transportation (WSDOT) has begun to offer flexible working schedules, internships, and ways to promote diversity, but they still have to compete with local employers like Microsoft. With recent technology changes, some are hopeful that attracting younger employees may become easier.

National Transportation Workforce Summit, Summary of Results

Citation: *National Transportation Workforce Summit, Summary of Results*. 2013. Council of UTCs, Washington, D.C.

Link: http://netwc.net/wp-content/uploads/2018/02/NTWS_Summary_of_Results1.pdf

Keywords: Workforce Challenges, Strategies

This report describes outcomes of the National Transportation Workforce Summit held in Washington, DC in April 2012. The Summit brought together workforce professionals from all modes of transportation and professionals from training resources to discuss workforce challenges and potential “Pathways to the Future.” National Cooperative Highway Research Program has identified four critical issues affecting the transportation workforce; 1) demographic changes; 2) career awareness and training; 3) new technologies; and 4) demand on transportation agencies. The Summit focused on three critical needs: 1) building and raising career awareness, 2) transition from education to the workplace, and 3) retention. The Summit participants created a framework of strategies to approach these challenges. These include things like reaching out to the future transportation workforce through outreach programs and creating career pathways; increasing interest and training opportunities for second careers; matching education curriculum with transportation industry needs; increasing retention in underserved populations; improving workforce resiliency through increased flexibility on job duties and training opportunities; improving data reliability; and continually adapting to changing technologies through web-based trainings and partnerships with vendors.

Preparing Tomorrow’s Transportation Workforce: A Midwest Summit

Citation: Nambisan, S., Hallmark, S., Albrecht, C., & Midwest Transportation Consortium. 2010.

Preparing Tomorrow's Transportation Workforce: A Midwest Summit.

Link: <https://intrans.iastate.edu/app/uploads/2018/08/2010MidwestSummitReport.pdf>

Keywords: Workforce Development, Education, Diversity, Youth

This report documents the outcomes of the Preparing Tomorrow’s Transportation Workforce: A Midwest Summit held in Ames, Iowa in April 2010. The Summit brought together transportation professionals to discuss future transportation workforce issues and assess educational and training needs for the next generation transportation workforce and identified successful strategies to address workforce issues. Some of the greatest workforce challenges discussed during the summit were related to attracting youth into transportation careers and attracting a diverse workforce. Successful strategies

implemented to address these challenges include programs like Project FREE, Women in Science and Engineering (WiSE), and Science Bound which offer extra-curricular activities geared towards attracting younger people, as well as women and minorities into science, technology, engineering, and mathematics (STEM) fields. Additionally, online magazines geared toward youth like *Go!* and *¡Vamos!* have been successful at promoting transportation careers.

Strengthening Skills Training and Career Pathways Across the Transportation Industry: Data Report on Future Transportation Workforce Needs

Citation: US Department of Transportation. 2015. *“Strengthening Skills Training and Career Pathways Across the Transportation Industry.”*

Link:https://s3.amazonaws.com/PCRN/docs/Strengthening_Skills_Training_and_Career_Pathways_Across_Transportation_Industry_Data_Report.pdf

Keywords: Data Analysis, Workforce, Wages, Retirement, Labor Shortage, Career Pathways

This report summarizes labor market data on six transportation sub-sectors: trucking, transit and ground passenger transportation, air transportation, highway construction and maintenance, rail transportation, and maritime transportation. Approximately 52 percent of the highway maintenance and construction workforce in 2014 was under the age of 45, but early retirements in this sector may mean replacement demand remains high. The report also notes that semi-skilled and skilled jobs in maintenance will be in the greatest demand. Most openings were for highway maintenance workers, construction laborers, and operating engineers. In highway construction, heavy equipment operators, construction managers, and truck drivers were in highest demand.

21st Century Workforce Development Summit

Citation: Wittver, E., Adams, T., Toledo-Duran, E. 2009. 21st Century Workforce Development Summit. WisDOT 0092-09-14, CFIRE 01-10, September 2009.

Link:

https://books.google.com/books?id=K0UdAQAAAJ&pg=PA7&lpg=PA7&dq=roadway+maintenance+workforce+development+pilot+program&source=bl&ots=XIUFQ8Bj04&sig=ACfU3UOFF8ledtbg3RD1z1iyddb2e8mIHg&hl=en&sa=X&ved=2ahUKEwibuZ_l8vfoAhWrFTQIHMMAmQQ6AEwCHoECAwQKQ#v=onepage&q=roadway%20maintenance%20workforce%20development%20pilot%20program&f=false

Keywords: Transportation, Workforce Needs, Public Agencies

The report summarizes findings of a workshop held in December 2008 with representatives from seven state departments of transportation to explore transportation workforce development issues and potential solutions. Preparatory work completed prior to the workshop included surveys of education institutions and state agencies as well as phone interviews with state leaders. Expert observations related to highway maintenance included a noted shortfall in expected revenue streams to ensure adequate maintenance of current transportation infrastructure, and new maintenance innovations like improved right-of-way maintenance focused on habitat and sustainability, the introduction of new technologies, and performance management systems. Major conclusions from the workshop included a consensus that transportation professionals will require a broader set of skillsets, to include communication, negotiation and financial and project management skills; greater gender, ethnic, and generational diversity in the workforce will require new efforts to attract diverse employees; and a greater breadth of educational and industry partnerships will be required to address rapidly changing workforce needs efficiently.

2017 Wisconsin Highway Maintenance Workforce Survey

Citation: Adams, T., Hart, M. 2018. *The 2017 Wisconsin Highway Maintenance Workforce Survey*.

Link: <https://trid.trb.org/view/1528637>

Keywords: Highway Maintenance, Workforce, Retention, Recruitment

The Wisconsin Highway Maintenance Workforce Survey gathered background information about the highway maintenance workforce in Wisconsin. Unlike other state DOTs, the Wisconsin DOT contracts all maintenance work to its counties. Other state DOTs directly employ maintenance workers, contract out maintenance work to private companies, or implement a combined approach of in-house and contracted maintenance work.

The report provides survey data that can be used to estimate the numbers of highway maintenance workers from entry to supervisory levels employed by local governments in the state. The report characterizes the scope of highway maintenance jobs in the workforce, prior education, and experience of entry-level workers. The survey found that most maintenance workers were coming to the job at an older age with previous experience in construction, truck driving, or farming. Employers noted that the most common reasons entry-level positions were difficult to fill was due to small applicant pools and lack of relevant work experience. Commercial driver's license (CDL) holders and applicants with equipment operation, critical and analytical, and computer skills were the most challenging for employers to find. Employers indicated that the most effective methods for new worker recruitment were word of mouth and postings on the organization's website. Unions were identified as the least effective recruiters, followed by connections to high school counselors. Major factors attributed to retention problems were identified as workers finding higher paying jobs for the same skills and lack of career progression/promotion opportunities. Primary sources of training for entry-level maintenance workers were OJT (other than apprenticeship) and in-house training prior to starting.

The report presents findings on employer interest in and familiarity with apprenticeship programs and the ACT National Career Readiness Certificate. Greater interest in apprenticeship programs appears to be driven by worker shortages. The report summarizes comments and thoughts from employers on the future vision at highway maintenance agencies including rebranding highway maintenance occupations and suggested new occupations.

Transportation Workforce Planning and Development Strategies - A Synthesis of Highway Practice

Citation: Puentes, R., Grossman, A., Eby, B., Bond, A. 2019. *NCHRP Synthesis 543: Transportation Workforce Planning and Development Strategies - A Synthesis of Highway Practice*. Washington, DC: The National Academies Press.

Link: http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_543.pdf

Keywords: State DOT Workforce Development, Career Pathways, Survey

The report highlights common challenges, opportunities, and lessons learned in implementing transportation workforce planning and development strategies at state DOTs and associated local technical assistance programs (LTAPs/TTAPs). The authors conducted a literature review and survey and gathered case studies to present current practices in place. Overall, the authors found training programs were understaffed and focused primarily on traditional roadway engineering, safety, and equipment operations topics. Additionally, they noted that there is no consensus between states on how to handle

workforce challenges or how to fund solutions, and institutional structures and approaches to workforce planning and development differ from state to state. Critical issues impacting transportation workforce were identified as: disruptions from emerging technologies competitive labor market wages, and the need to replenish workforce and replace retiring senior-level staff.

Transit Workforce Development – Improved Strategic Planning Practices Could Enhance FTA Efforts

Citation: US Government Accountability Office. 2019. *Transit Workforce Development – Improved Strategic Planning Practices Could Enhance FTA Efforts*. GAO-19-2090. March 2019.

Link: <https://www.gao.gov/assets/700/697562.pdf>

Keywords: Similar Sector, Public Transportation, Workforce Development

Each year the Federal Transit Administration (FTA) provides an estimated \$12 billion to support and expand public transportation service. Operating public transportation requires a skilled workforce, but with recent retirements, advances in technology, and a lack of interest from younger generations, the public transportation industry is having difficulties filling and developing the next generation workforce. This report by the Government Accountability Office found that workforce needs for the public transportation industry were relatively unclear due to a lack of data and workforce projects. The best data available was from the Transportation Industry Report in 2015 which estimated 1 million job openings in the public transportation industry from 2012 to 2022. Some transit agencies have successfully begun to address these workforce needs. This was done primarily through providing “upskilling” opportunities, developing both classroom training and on-the-job learning opportunities, internships, managerial training, and conducting research into workforce needs. The FTA assists with these workforce needs through developing trainings and providing funding opportunities, but the Government Accountability Office recommends strategic planning that outlines industry needs and documents how FTA will help address those needs, as well as performance goals so that the industry can track progress over time.

Help Wanted: People, Organizations, Jobs, and Businesses for Tomorrow’s Transportation

Citation: Lemer, A. 2019. *Help Wanted: People, Organizations, Jobs, and Businesses for Tomorrow’s Transportation*. TR News. September-October 2019.

Link: <http://onlinepubs.trb.org/onlinepubs/trnews/trnews323HelpWanted.pdf>

Keywords: Workforce Challenges

There is an increasing concern throughout the transportation industry that there are not enough skilled professionals to fill jobs and a lack of ability to compete with private sector employers. This issue of *TR News* focuses on workforce challenges that the transportation workforce is facing and strategies to fill workforce gaps. This issue highlights the need for a cross-modal view of the transportation workforce – many skills and competencies needed to manage the future transportation system are not unique to the transportation sector. Adopting a wider mindset will allow transportation agencies to attract talented and skilled professionals into the industry.

Recent Lessons from the Stimulus: Transportation Funding and Job Creation

Citation: Smart Growth America. 2011. *Recent Lessons from the Stimulus: Transportation Funding and Job Creation*.

Link: <https://smartgrowthamerica.org/app/legacy/documents/lessons-from-the-stimulus.pdf>

Keywords: Workforce Challenges, Funding

The American Recovery and Reinvestment Act (ARRA) provided states and metropolitan planning organizations (MPOs) with \$26.6 billion for surface transportation needs with an emphasis on delivering jobs and restoring the economy. This report by Smart Growth America examines how states spent that money on projects and whether this produced the maximum number of job opportunities. On average public transportation investments generate 31 percent more jobs per dollar than new construction of roads and bridges, and road and bridge repair work generate 16 percent more jobs per dollar than new bridge and road construction. While some states focused their funding toward system preservation, many focused efforts on creating new capacity. The authors found that if \$2 billion of the ARRA money would have been shifted to public transportation projects it would have created 4,300 more jobs. This report recommends future investments in repair and public transportation in order to promote long-term job creation and improve the economy.

Transportation Maintenance Operations Workforce Development: Challenges, Opportunities, and Solutions

Citation: Bergner, D. 2018. Transportation Maintenance Operations Workforce Development: Challenges, Opportunities, and Solutions. International Conference on Transportation and Development. Link: <https://www.workzonesafety.org/publication/transportation-maintenance-operations-workforce-development-challenges-opportunities-and-solutions/>

Keywords: Highway Maintenance, Workforce, Retention, Recruitment

Transportation agencies at all levels are facing workforce challenges related to retirements, generational differences between younger and older employees, as well as new technology and training requirements. This paper presents innovative training and workforce development strategies to recruit and retain skilled maintenance professionals. The education and skills that maintenance and operations professionals require has evolved overtime with evolving technology. While on-the-job training is common, some agencies have developed standardized training and testing including the Louisiana Transportation Research Center of the Louisiana Department of Transportation and Development Maintenance Training Unit which develops job-specific courses for necessary skills required by maintenance field professionals. Many agencies require employees to be certified in work zone traffic control and have occupational health and safety administration work site safety training, as well as hazardous materials and first aid/CPR. These training requirements face several challenges related to a lack of funds and time. Alternatives like video, computer, or web-based trainings offer an approach to provide training on a more cost-effective manner. Many training modules are available for roadway and traffic workers from various agencies including local technical assistance programs, American Public Works Association, National Highway Institute, American Road and Transportation Builders Association, and others.

Critical Issues in Trucking Workforce Development

Citation: O'Brien, T., Reeb, T., Matsumoto, D., & Sanchez, D. 2020. Critical Issues in Trucking Workforce Development. Mineta Transportation Institute.

Link: <https://transweb.sjsu.edu/sites/default/files/1941-0%27Brien-Critical-Issues-Trucking-Workforce-Development.pdf>

Keywords: Similar Sector, Trucking, Workforce Development, Challenges

This whitepaper identifies critical issues faced by the trucking workforce in California. The authors conducted interviews with national and state trucking industry members, and leaders from relevant sessions at the 2020 Transportation Research Board Annual Meeting. These efforts found several key issues within the trucking industry. While many fear that automation and platooning may cause job losses, these technologies are far in the future. The trucking industry needs to reframe the discussion around automation to ensure prospective workers that there will still be a demand for drivers. Although new transportation and logistics technologies have created the need for new workforce training, though further research is needed in industry to determine the best way to provide this training whether that be online or in-person and whether improving training can reduce some of the barriers to employment within the trucking industry. The authors found that while many face labor shortages in the trucking industry, this shortage may actually be due to “churn” or movement of employees within the industry from one trucking job to another, this churn is often occurring due to pay. While a driver must be age 21 to receive a commercial driver’s license (CDL), trucking companies are looking to ways to retain younger drivers (age 18-21) so that by the time they turn 21 they can become a CDL driver. The American Transportation Research Institute (ATRI) has advocated for graduated CDL program to help capture younger drivers, but further research is needed to examine younger drivers entering the workforce and the barriers they face. This study aimed to examine labor market challenges faced by the trucking industry. Many policy recommendations and areas of for future research were suggested.

Acting Now, Building for the Future

Citation: Glenn, V. 2006. Acting Now, Building for the Future. Public Roads. Federal Highway Administration.

Link: <https://www.fhwa.dot.gov/publications/publicroads/06may/04.cfm>

Keywords: Workforce Development, Funding

In this article for Public Roads, Vicki Glenn describes the provisions under the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) which aimed to promote workforce development at state DOTs. SAFETEA-LU provided states more than \$26 million annually for training and education programs, and allowed state DOTs to fund training programs through five core programs – 1) Surface Transportation Program (STP), 2) Bridge Program, 3) Interstate Maintenance Program (IM), 4) National Highway System Program (NHS), and 5) Congestion Mitigation and Air Quality Improvement Program (CMAQ). Building off of previous efforts including the 2002 Workforce Summit, SAFETEA-LU looked to raise career awareness, provide opportunities to train skilled employees, and create pathways for students to transition to transportation careers.

Recent News Articles

States Feel Brunt of Driver Shortage in Search for Snowplow Drivers

Link: <https://www.ttnews.com/articles/states-feel-brunt-driver-shortage-search-snowplow-drivers>

The article describes the common issue state DOTs in the Northeast and Midwest have in hiring adequate numbers of temporary seasonal snowplow drivers. DOT difficulties finding CDL holders mirror those experienced in the trucking industry. The long hours, frigid conditions, and variable work schedules required of snowplow operators further exacerbate recruitment issues. PennDOT has responded by increasing the number of recruiters on staff. It also promotes opportunities to join the agency as permanent staff (currently PennDOT has a 33 percent rate of seasonal-to-permanent

promotions). Minnesota achieves successful seasonal staffing by beginning recruitment efforts early (in summer) and by repeatedly posting vacancies.

CDOT Begins Hiring for Winter Positions, Hoping to Combat Snowplow Driver Shortage

Link: <https://www.vaildaily.com/news/colorado/cdot-begins-hiring-for-winter-positions-hoping-to-combat-snowplow-driver-shortage/>

CDOT reported a shortfall of 100 snowplow drivers last winter (2018) and fears a repeat in the coming winter. Low unemployment and a CDL requirement both constrict the available labor pool. If hiring efforts fall short, plowing services will be delayed in some parts of the state. CDOT began implementing new incentives to draw in snowplow drivers last year and plans to continue them. They include raising wage to \$23/hour, the potential for housing stipends, and wage incentives for retired CDOT maintenance staff to return to work. CDOT is also implementing nationwide, rather than statewide, personnel searches.

PennDOT Faces Local Snow Plow Driver Shortage as Winter Approaches

Link: https://www.heraldstandard.com/new_today/penn-dot-faces-local-snow-plow-driver-shortage-as-winter-approaches/article_d007cbd0-1611-11ea-b106-1bd9cb7ac333.html

High demand from other industries requiring workers with commercial driver's licenses is creating concern among PennDOT District 12 managers that they will be able to hire enough plow drivers for the district. PennDOT requires a CDL plus two months experience operating and maintaining a single-chassis truck with a gross vehicle weight rating between 26,000 and 32,000 pounds or successful completion of the Transportation Equipment Operator Trainee Program. Wages start at \$16.42/hour.

PennDOT's Plea for Plow Drivers, Mechanics

Link: <https://www.wnep.com/article/news/local/lackawanna-county/penndots-plea-for-plow-drivers-mechanics/523-590e7bf1-b3ca-4887-a7fc-c07c432af967>

A shortage of snowplow drivers and diesel mechanics at PennDOT is putting pressure on existing staff who are working long 16-hour shifts in some cases. Shortages are blamed on industries competing for drivers, like Amazon and the natural gas industry. Wages for temporary seasonal drivers are \$18 to \$20 an hour and can lead to permanent full-time employment.

Maine Is Heading Into Winter With A Plow Driver Shortage...Again

Link: https://q1065.fm/maine-is-heading-into-winter-with-a-plow-driver-shortage-again/?utm_source=tsmclip&utm_medium=referral

On and off over the years, Maine towns are facing shortages of plow drivers. In response, some towns are raising hourly wages by up to \$3.50/hour.

Plow Driver Shortage Hits Several Massachusetts Towns

Link: <https://wbznewsradio.iheart.com/content/snow-plow-driver-shortage-dpw-north-attleboro-mansfield-contractors-lost/>

For three Massachusetts communities, the pool of snow removal contractors is shrinking due to difficulties in finding snowplow drivers. Some businesses have had to raise their rates by \$10 an hour to stay competitive.

CDOT Plows Roads Despite Driver Shortage

Link: <https://www.9news.com/article/news/local/next/cdot-plows-roads-despite-driver-shortage/73-844b6c5b-3be2-4cdd-bda7-3367af1f5527>

In September 2019, Colorado Department of Transportation (CDOT) put out a call for 111 maintenance worker job opportunities, within a month they filled 65 positions. Worker shortages have been challenging because people who have a CDL are working for other agencies. CDOT increased pay for temporary workers to \$23 per hour and was offering retired CDOT maintenance workers \$25 per hour to come back to work, in hopes that these incentives could help fill the worker shortage.

Kansas Hiring to Fill Snow Plow Driver Shortage

Link: <http://www.kake.com/story/41138818/kansas-hiring-to-fill-snow-plow-driver-shortage>

Between recent retirements and people leaving for other jobs, Kansas Department of Transportation was looking to hire 171 new employees in 2019, 73 of these opportunities were for snow plow operators. A driver for the Kansas Department of Transportation mentions the job requires rotating 12-hour shifts, but that the hours are worth it to ensure public safety.

Shortage of Plow Workers Creates Challenges for Public Works Crews During Snowfalls

Link: <https://waow.com/2020/01/02/shortage-of-plow-workers-creates-challenges-for-public-works-crews-during-snowfalls/>

Wausau Public Works in Wisconsin faced a shortage of five snowplow drivers in 2020. This has resulted in current snowplow crews having to make up around 50 hours in overtime to fill the gap. These workplace shortages have delayed snowplow response and has created a hardship on current staff, particularly for long snow events. Wausau City officials face numerous challenges hiring snowplow drivers including long hours, retirements, low wages, and at times verbal abuse from residents. The City is looking to hire more snowplow drivers, promoting the benefits packages that are offered in hopes that this will attract new workers.

Lack of Plows Leads to Delays, Higher Costs

Link: <https://www.valleybreeze.com/2019-12-11/cumberland-lincoln-area/lack-plows-leads-delays-higher-costs#.XqiXgWhKi70>

In Rhode Island, increasing costs for snowplow drivers and snowplows has led to higher costs and slow responses to storms throughout the state. Cumberland Highway Superintendent mentioned insurance rate increases have brought up the total to \$4,000 or more and the cost to attach a plow to a pickup truck are now more than \$6,000. These increasing costs have led to driver shortages which have led to diminished service.

State DOT Seeking Workers to Fight Snow this Winter

Link: <https://dailygazette.com/article/2019/08/27/state-dot-seeking-workers-to-fight-snow-this-winter>

A lack of CDL holders and low unemployment has led to difficulties hiring truck drivers, heavy equipment operators, and mechanics at New York Department of Transportation. The DOT has expanded recruitment efforts by posting signs at interstate rest areas and DOT facilities and sending out a media blast calling for seasonal employees with the opportunity to become a permanent employee. The Civil Service Employees Association union has helped support these efforts statewide.

Generational Differences

Millennials in the Transportation Workforce

Citation: Gallagher, S. and N. Villwock-Witte. 2016. Millennials and the Transportation Workforce. In *Transportation Research Record: Journal of the Transportation Research Board*, No. 2552, Transportation Research Board of the National Academies, Washington, D.C. DOI 10.3141/2552-06. Link: <http://journals.sagepub.com/doi/pdf/10.3141/2552-06>

Keywords: Generations, Millennials, Workforce, Human Resources, Departments of Transportation

Generational differences in the United States are of increasing concern to human resource professionals as they prepare to manage the rapid demographic shifts expected in the transportation workforce. As Baby Boomers retire and Millennials increase their share of the workforce, transportation agencies are seeking to better understand what workplace attributes will be most successful in attracting and retaining Millennials. The paper contextualizes challenges faced by state DOTs within the current research literature on generational differences to identify mutual concerns in addition to successful strategies that state agencies can employ to attract and retain young staff. A literature review was conducted in conjunction with focus group discussions. Six staff from human resource departments representing five state DOTs (Alaska, Minnesota, Montana, Oregon, and Wisconsin) participated. The study found that state DOTs offer many attributes attractive to the younger generation: job security; opportunities for personal and professional development; flexible schedules; and vacation and work expectations that allow for work-life balance. The authors identify a number of opportunities for collaboration among state DOTs to share information and leverage resources to meet collective challenges.

Shared issues of concern included technology and social media use, mentorship capacity, attrition, and public image. Focus group participants acknowledged the need for state DOTs to have a fully developed online and social media presence to reach Millennials. Building in-house mentorship capacity to meet the desire of younger workers for more constant feedback was also an area of common concern. Mentorship and social media plans represent two fruitful areas for peer exchange, shared training, or other means of leveraging resources among state DOTs to better meet these collective gaps.

Involvement of Millennials in business process reviews may also help implement organizational changes that are more attractive to the younger generation. Some of these changes may involve a shift in how technology use and work/life management is embedded in the workplace. Allowing young staff the opportunity to develop new social media campaigns or to enhance the DOTs' online presence could serve the dual purpose of both engaging existing tech savvy young staff and better reaching new recruits. Further, states could collaborate to develop common career messaging that highlights the attractive attributes of DOT careers and showcases the diversity of existing successful internship, leadership development, and job rotation programs. Furthermore, if career mobility trends continue as predicted, DOTs will need to start planning for shorter employee tenures and to develop creative strategies to obtain the best return on investment (e.g. creating an environment that encourages previous staff to return after a period of time spent outside the agency [short-term solution], bringing with them the additional skills they have acquired elsewhere).

Responding to the Demographic and Skills Shifts in the Mobility Workforce

Citation: Cronin, B., Alexander, A. 2019. Responding to the demographic and skill shifts in the mobility workforce. In T. Reeb (Ed.), *Empowering the New Mobility Workforce*. Elsevier.

Link: <https://doi.org/10.1016/B978-0-12-816088-6.00006-7>

Keywords: Labor Market, Workforce, Pipeline, Diversity, Generations, Recruitment, Retention

The authors provide an overview of transportation workforce labor market data and trends. Recommended strategies to recruit and retain new workers include: expanded outreach into new areas and non-traditional labor pools, customization of job benefits to match current preferences of new job seekers, promotion of desirable on-the-job opportunities such as career ladders that allow for quicker advancement and mentorship program, establishment of workplace cultures that value diversity, and establishment of diverse organization leadership teams. Organization leaders should anticipate impending changes, use data to analyze opportunities, make plans based on needs and trends, and implement strategies to support knowledge retention.

Behavioral Considerations

Public Transportation Workforce Development: A Survey of Vocational and University Students

Citation: Ripplinger, D., and J.A. Hough. 2010. *Public Transportation Workforce Development: A Survey of Vocational and University Students*. No. DP-229. Upper Great Plains Transportation Institute, North Dakota State University.

Link: <http://www.ugpti.org/pubs/pdf/DP229.pdf>

Keywords: Similar Sector, Public Transportation, Higher Education, Workforce Attitudes

Students from North Dakota State University, Minnesota State University Moorhead, and Minnesota State Community and Technical College – Moorhead were surveyed to identify attitudes and behaviors that impact their choice of academic major, internship, and career, as well as perceptions of careers in public transportation. Participants did not vary significantly by major. Overall, there was not a strong attitude towards internships or careers in transit and many of those that did report strong feelings leaned towards the negative. Internships and careers in public transportation were viewed as not providing opportunities to apply existing skills and were thought to be uninteresting and unchallenging intellectually. It is also believed that a career in transit would not provide opportunities to work with technology. Strategies to address these attitudes should be considered including educating students on the transportation industry and career opportunities.

Emerging Technology

The Future of Work in Government, Navigating a Shifting Talent Landscape

Citation: Eggers, W.D., O'Leary, J., Datar, A. 2019. *The Future of Work in Government, Navigating a Shifting Talent Landscape*. Deloitte Insights, Feb. 28, 2019.

Link: <https://www2.deloitte.com/us/en/insights/industry/public-sector/future-of-work-in-government.html>

Keywords: Emerging Technology, Automation

Successful private sector organizations have begun to shift their workforce management to promote worker skills and create a more productive employee-employer relationship. By creating a better employee-employer relationship, this allows an organization to recognize an individual worker's unique

skills and talents and better understand where they need to improve skills to be a successful team member and creates an environment where an employee is motivated and encouraged to learn and grow within their career. The public sector has fallen behind. Many public sector organizations have rigid job descriptions, pay scales, and rely on seniority as an indicator of skill. These old school approaches have left a workforce shortage in the public sector.

With emerging technologies (automation and cognitive technologies) the public sector has the opportunity to change the future of public sector work, workforce, and workplace. These technologies can benefit an organization through extending (or doing more work), optimizing (doing work better), and expanding value (doing work differently). Automation and artificial intelligence (AI) technology can be used to supplement rather than replace skilled employees. With these changes in technologies and employment, public sector organizations will need to alter their staffing and career models. These changes could include: creating “talent clouds” or allowing employees to use their talents and skills across departments on projects of interest or that best fit their skills; look to crowdsourcing talent; look at “tour of duty” programs that allow experts to be brought in for short projects (this type of program could fill the talent gap by allowing the private sector to work on projects on a limited basis); explore new methods of recruitment like predictive analysis or augmented decision-making to find skilled employees –using AI-based recruitment tools can improve diversity, reduce time to hire, and increase retention (European Union’s Public Sector Job Mobility Platform).

Additionally, a focus on employee well-being can go a long way. There is growing evidence that employees want to achieve a better sense of well-being, but a recent Federal Work Life Survey found that only 35 percent of respondents felt their workplace demonstrated a commitment to improving employees’ well-being. Technology has created high levels of employee stress, particularly if employees feel like they cannot unplug, which can result in high turnover and a loss of productivity. Investments in professional development and opportunities for learning (experiential learning) have been successful at creating more confident, less stressed employees.

Eggers et al. recommend seven ideas to address workforce challenges:

1. Simplify job classifications – shift from a focus on specific skills to looking at competencies and capabilities
2. Create flexible personnel systems – including flexible benefits packages tailored to an individual – these can create new tools to recruit and retain employees
3. Continuous skills improvement for employees
4. Adapting skills improvement for today’s jobs while considering future needs
5. Retrain workers for new roles – particularly important for jobs that could be replaced by technology
6. Use technology to supplement human capabilities
7. Create next-gen apprenticeships – these apprenticeships would ideally blend education with work experience and provide an opportunity to create pathways to “middle skills” jobs.

Historical Perspectives on Managing Automation and Other Disruptions in Transportation

Citation: Brown, A., Safford, H., Sperling, D. 2019. Historical perspectives on managing automation and other disruptions in transportation. In T. Reeb (Ed.), *Empowering the New Mobility Workforce*. Elsevier.

Link: <https://doi.org/10.1016/B978-0-12-816088-6.00001-8>

Keywords: Automation, Economy, Workforce

The authors make several recommendations for policymakers, planners, managers, and operators related to managing the expected workforce disruptions in transportation sectors resulting from automation. These include conducting research to gather input from vehicle operators on additional trainings of interest; identify specific skillsets needed with the adoption of autonomous vehicles (AVs) and to develop rapid training to meet needs and quantify job creation potential from automation. The research can then be utilized to identify sector-specific impacts; to provide displaced workers with retraining programs; and to develop flexible policy frameworks.

The Great Transformation: The Future of the Data-Driven Transportation Workforce

Citation: Bills, T.C. 2019. The great transformation: the future of the data-driven transportation workforce. In T. Reeb (Ed.), *Empowering the New Mobility Workforce*. Elsevier.

Link: <https://doi.org/10.1016/B978-0-12-816088-6.00002-X>

Keywords: Information Technology, Asset Management, Whole Lifecycle Information Management

The author describes expected workforce changes driven by technology and provides some guidelines for transportation agencies to help manage these changes. Six significant trends are outlined that are changing agencies' approach to infrastructure planning, construction, and operation and maintenance: data-driven decision-making requirements, performance-based planning, digitalization of transportation processes, civil integrated management, greater emphasis on asset preservation, and greater expected collaboration between various public agencies. All of these trends require robust data collection, integration, and analysis processes, and system and performance improvement processes, as well as better public engagement through improved information access and transparency. Integrated information systems will improve infrastructure life-cycle management and could produce significant operations and maintenance cost savings. However, greater technical skills will be required of the workforce to collect, model, and analyze data. Examples provided include a shift in field data collection methods from paper to tablet use, as well as use of LiDAR and other laser-based technologies. For maintenance activities, complex decision support models can help prioritize the most critical and strategic maintenance activities.

Skills Gaps

Measuring the Transportation Workforce Skills Gap Using New Indices and Survey of Employers and Workers

Citation: Simkins, Z., and R. Muhjabeen. 2017. *Measuring the Transportation Workforce Skills Gap Using New Indices and Survey of Employers and Workers*. Journal of the Transportation Research Forum, 56(3) Fall.

Link: <http://journals.oregondigital.org/index.php/trforum/article/viewFile/4447/4345>

Keywords: Skills Gaps, Transportation, Employers, Workers

In this article for the *Journal of the Transportation Research Forum*, Simkins and Muhjabeen examine four indices to determine whether there is a skills gap in the transportation and materials moving industry and if so, what knowledge, skills, and abilities (KSAs) are missing. The intent is to help identify and address possible KSA gaps faced by the transportation industry. Four indices were used to examine skills gaps, these include: 1) occupational skills gap; 2) employed skills gap; 3) unemployed skills gap; and

4) vacancy skills gap. Survey data was used from 21 employers with 23 job vacancies in transportation and materials moving, and from 7 employees who reported transportation and materials moving as their occupation. Results of the survey data show occupational competency expectations – worker perceptions of the KSAs necessary for a job are different from those sought by employers. KSA gaps were found in the following areas: knowledge of transportation, distribution, and logistics; knowledge of machines, tools, and equipment; equipment operation, maintenance, repair, and troubleshooting skills; critical thinking and problem-solving skills; work prioritization and resource-management skills. KSA gaps were not the only reason behind worker shortages – other challenges included inadequate pay and a lack of relevant work experience. Simkins and Muhjabeen recommend organizations work with workforce development agencies and colleges to align training programs with necessary KSAs. Additionally, establishing on-the-job training programs could allow an agency to develop new employees.

Forecasting Needs

Forecasting Long Term Highway Staffing Requirements for State Transportation Agencies

Citation: Li, Y. 2016. "*Forecasting Long Term Highway Staffing Requirements for State Transportation Agencies*". Theses and Dissertations--Civil Engineering. 42.

Link: https://uknowledge.uky.edu/ce_etds/42

Keywords: State Transportation Agency, Staffing, Highway Maintenance, Forecasting

The dissertation provides a statistical model for quantifying how many engineers and engineering technicians will be required by state transportation agencies over a 25-year simulation period. The author notes that while lane miles under State Transportation Agency (STA) management has increased, in-house staff has decreased. STAs therefore need a robust method to forecast workforce needs, but this is a challenge without well-defined future project portfolios. Model parameters were developed, and simulations were run to forecast staffing level requirements under various scenarios. The model provides a tool for STAs to calibrate to their agency's specific circumstances to make long-term staffing forecasts based on performance targets.

Strategies

Overview

Recruiting, Retaining, and Promoting for Careers at Transportation Agencies

Citation: Harper, C., Halter, S., Kommalapati, R., Choe, D. 2018. Recruiting, Retaining, and Promoting for Careers at Transportation Agencies. Transportation Consortium of South-Central States.

Link: https://digitalcommons.lsu.edu/cgi/viewcontent.cgi?article=1019&context=transet_pubs

Keywords: Recruiting, Retaining, Interviews, Survey

State DOTs are increasingly dealing with challenges related to recruitment and retention of skilled employees and with attracting young, diverse individuals into the workforce. With the aging of the current transportation workforce, these problems need to be addressed. This study conducted by Harper et al. examines the current state of the practice and strategies to attract, retain, and promote a skilled workforce. This study was focused on Region 6 DOT states (South-Central). Interviews with nine human resources professionals at state DOTs were conducted and a survey of 1,109 state DOT employees to gain an understanding of workforce issues. Findings show struggles with competing with

the private sector for salary compensation. Some DOTs have found methods to work around this issue by quantifying benefits offered with salary, creating entrance pay systems that provide incoming employees with a higher salary than the typical minimum, and offering benefits like flexible work weeks, education assistance, and health and retirement benefits. Recruitment strategies were similar across these states including promoting the benefits packages offered, using social media and the state DOT website to promote job offers, and participation in job fairs. An understanding of the generational differences has been found to be important in employee recruitment and retention. All DOTs experienced high employee turnover and many cited competitive labor-market conditions as the reason why. The survey data implied that the use of special compensation programs (for example receiving extra compensation for special recognition), bonus opportunities, and quantifying benefits programs have been found as strategies to promote employee retention. Based on results of this analysis the authors recommend the following strategies to recruit and retain skilled employees: use social media and the internet; quantify benefits packages offered along with salary; offer flexible work schedules; base promotions and incentives on employee performance; improve department morale; promote the importance of working for a public agency; and require that employees who obtain education or a license with support from the DOT remain at the DOT.

Tools to Aid State DOTs in Responding to Workforce Challenges

Citation: National Academies of Sciences, Engineering, and Medicine. 2009. *Tools to Aid State DOTs in Responding to Workforce Challenges*. Washington, DC: The National Academies Press.

Link: <https://doi.org/10.17226/14247>

Keywords: State Agency, Staffing, Human Resources, Toolkit

The NCHRP Project 20-72 developed a prototype online dynamic toolkit for state DOTs to use to address emerging workforce needs. The two-phase project first reviewed literature and practice to identify useful resources; then developed a workforce toolkit website that allows users to access relevant resources based on workforce needs or questions. The resources address the top ten issues identified by the research team, to include:

- Strategic workforce planning;
- Attracting and retaining talent;
- Developing the next generation of leaders;
- Downsizing and reduction in force;
- Employee conflicts and performance issues;
- Improving HR efficiency and effectiveness;
- Outsourcing;
- Organizational change;
- Preserving institutional knowledge; and
- Retooling the workforce to meet evolving business needs.

In order to stay relevant, the toolkit is designed as a dynamic site and the authors recommend it be administered and managed long-term through AASHTO.

European Practices in Transportation Workforce Development

Citation: Rahn, P., Gilmore, G., Toole, J., Griffin, G., Bergquist, R., Carmichael, R., Hawkins, J., Ferguson, D., Harrington-Hughes, K. 2003. *European Practices in Transportation Workforce Development*.

FHWA/USDOT Office of International Programs. June 2003.

Link: <https://trid.trb.org/view/660470>

Keywords: Workforce Development, Transportation, International

The report provides information on workforce development strategies implemented in Germany, England, France, and Sweden to address similar transportation workforce challenges related to recruitment, retention, and training. Recommendations under four categories—career awareness, workforce development, program effectiveness, and recruitment—are outlined. Sweden’s development program consisted of a trainee program (for engineers recruited from universities), a career choice seminar (aimed at developing leadership skills in young employees), a new managers development program, and an experienced managers program. The Swedish National Road Administration (SNRA) uses the motto “hire for competence, train for skills,” and each staff member has a performance plan in place to track their career development. Staff at state and federal highway agencies in Germany include civil service employees who complete a rigorous two-year training program before attaining full status. Efforts are made to integrate employee performance and development. France, likewise, has a competitive civil service program. There are strong ties between the government and universities as well as vocation training centers. England’s Highways Agency has implemented a 10-year policy that links high-level objectives and business plans to individual staff plans.

Based on the international scan, the authors propose the following recommendations.

- To encourage career awareness:
 - o Develop commitment and funding for K-12 career awareness programs;
 - o Develop comprehensive program to introduce teachers to transportation issues and careers;
 - o Continuously market transportation industry’s heroes and success stories to youth;
 - o Identify core job characteristics that entry-level workers seek in jobs and strive to meet those expectations.
- To improve workforce development:
 - o Define critical leadership roles in the face of a changing industry;
 - o Develop mechanism to develop leadership competencies;
 - o Better prepare employees for change;
 - o Craft new sources for developing needed skills and competencies.
- To ensure program effectiveness:
 - o Engage whole industry in workforce development;
 - o Develop self-sustaining model for sharing best practices;
 - o Integrate workforce development and retention into organizational business processes;
 - o Establish framework for delivering and measuring learning.
- To increase recruitment:
 - o Formalize relationships with education providers;
 - o Create means to attract more students to civil engineering and to remove financial barriers to their successful educational attainment.

Building a Sustainable Workforce in the Public Transportation Industry – A Systems Approach

Citation: ICF International, Inc. and Boyd, Caton & Grant Transportation Group. 2013. *Building a Sustainable Workforce in the Public Transportation Industry—A Systems Approach*. Transit Cooperative Research Program Report 162. Transportation Research Board.

Link: <http://www.trb.org/Main/Blurbs/169592.aspx>

Keywords: Similar Sector, Public Transportation, Workforce

The transit industry is facing a critical shortage of skilled employees as thousands of workers are nearing retirement age over the next 5 to 10 years. *Building a Sustainable Workforce in the Public Transportation Industry – A Systems Approach* explores issues in workforce development, retention, attraction, and public transportation image management. This guide provides workforce strategies, performance metrics, image management techniques, and benchmarking processes that allow for continuous organizational improvement. This report is divided into four modules: (1) effective strategies in workforce practices, (2) metrics to evaluate the impact of workforce practices, (3) improving image management, and (4) benchmarking to engage in continuous improvement.

Recruitment strategies highlighted in the successful workforce practices module include: hosting career days for students; developing and implementing internship and scholarship programs; implementing employee referral programs; recruiting nontraditional applicants; establishing applicant screening processes; incorporating realistic job previews; highlighting employee benefits; using social networking; developing student curriculum or training programs; using structured interview protocols; and targeting candidates from other industries. Retention strategies include: creating dual career tracks for managers and technical experts; creating advancement within positions; implementing mentoring programs; offering alternative benefits packages; assessing and improving organizational culture; implementing rewards programs for high performers; improving work schedules; promoting current employees; establishing diversity goals and policies; and emphasizing job enrichment. Effective training and development strategies identified include: leveraging existing training and development programs; exploring available funding for training; making training attractive; addressing training needs in conjunction with performance appraisals; creating a corporate college for on-the-job training and certification; adopting means of supporting higher education and training; instituting internship or apprenticeship programs; developing partnerships with other organizations; mentoring; and placing a high priority on safety and security-related training. Professional capacity building strategies include: develop a management academy; establish regular management retreats, workshops or events; use competency-based leader selection and training; implement mentoring/coaching programs for leaders; institute a job rotation program; use cross-training or shadowing; develop formal career paths; use individual development plans; implement workforce/succession planning; and develop a knowledge management system. Implementation of successful strategies is linked to improved image of public agencies. The guide provides metrics and scorecards for organizations to assess their workforce practices in each of the four categories.

Managing Transit's Workforce in the New Millennium

Citation: McGlothlin Davis, Inc and Corporate Strategies, Inc. 2002. *Managing Transit's Workforce in the New Millennium*. Transit Cooperative Research Program Report 77. Transportation Research Board, Washington, DC.

Link: http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_77.pdf

Keywords: Similar Sector, Public Transportation, Management, Recruiting, Retention, Employment, Labor Force, Training

Managing Transit's Workforce in the New Millennium assesses the transit industry's workforce needs and prospects for the coming decades, presents guidelines to help employers assess their own workforce needs, includes a description of best practices for recruiting and retaining employees, and examines ways to enhance or establish partnerships between management and labor for attracting, training, and maintaining a qualified workforce. A literature review as well as benchmarking and industry surveys were utilized to identify best practices in recruiting, and training and retaining a qualified workforce. Findings were that the same attributes that attract new workers also help to retain them. Major factors include employment that provides challenging work and opportunities to grow, workplaces that value employee contributions, and fair compensation. Poor relationships with supervisors was correlated with attrition, pointing to the need to focus on attributes, preparation, and accountability of managers.

Workforce Development Summit Proceedings - Implementing, Disseminating, and Modeling Ladders of Opportunity – Proceedings

Citation: Federal Transit Administration. 2016. Workforce Development Summit Proceedings - Implementing, Disseminating, and Modeling Ladders of Opportunity – Proceedings.

Link: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/FTA_Report_No._0096.pdf

Keywords: Similar Sector, Public Transportation, Workforce Development, Challenges

The Federal Transit Administration (FTA) awarded \$20.5 million for 45 grants to support public transportation workforce development programs in FY 2011. In 2016, the FTA and the National Transit Institute held the Workforce Development Summit: Implementing, Disseminating, and Modeling Ladders of Opportunity in order to showcase best practice workforce development strategies. This Summit highlighted the need for youth engagement; internship, apprenticeship, training, and curriculum development; and hiring practices.

Transportation Workforce Recruitment and Retention Strategies

Citation: Tang, Q. 2017. Transportation Workforce Recruitment and Retention Strategies. Minnesota Department of Transportation.

Link: <https://www.dot.state.mn.us/research/RFP/Lit/LS-508.pdf>

Keywords: Recruitment, Retention, Literature Review

The transportation industry is facing a growing workforce shortage due to numerous factors including less interest in the field, retirements, generational differences, competition from the private sector, and increasing educational requirements. This literature review conducted by the Minnesota Department of Transportation examines strategies to recruit and retain employees to the transportation industry. Potential recruitment and retention strategies included improving branding; creating a recruitment toolkit; improving outreach efforts; aligning career and technical education programs with labor needs; partnerships between apprenticeship programs and community colleges; and creating experiential learning opportunities for students.

Identify Train Place – A Playbook to Build Tomorrow's Highway Construction Workforce

Citation: Center for Transportation Workforce Development. 2019. Identify Train Place – A Playbook to Build Tomorrow's Highway Construction Workforce. USDOT Federal Highway Administration.

Link:

https://www.fhwa.dot.gov/innovativeprograms/centers/workforce_dev/hcwp/pdfs/hcwp_playbook.pdf

Keywords: Similar Sector, Highway Construction, Workforce Development, Strategies

This playbook takes lessons learned from the Highway Construction Workforce Pilot Project, which was conducted in six cities and six states across the US. This program worked to identify successful strategies to help trained workers find employment and help build a highway construction workforce. The playbook described 8 “plays” or helpful principles to guide the workforce development process. These include: 1) “let industry quarterback your team” or collaborate and create roles for construction industry leaders on your working group as these individuals have the best understanding of industry needs and upcoming work; 2) “organize your players for success” meaning recruit far and wide for potential working group partners; 3) “focus on fundamentals” or look to provide workers with basic job skills and allow for construction firms to provide on-the-job training; 4) “communicate the value of highway construction careers”; 5) “find and fill the small cracks” or work with local community organizations outside of the transportation industry to identify and fill the cracks where people are leaving your workforce development system; 6) “bring community colleges into the game” as community and tribal colleges are suited to address local workforce development needs through trainings, classes, and events; 7) “start with proven strategies” - use existing programs and products to address workforce development gaps; and 8) “keep your eye on the ball” - understand that this is a long-term goal.

Highway Construction Workforce Partnership Summary of Activity

Citation: American Concrete Pavement Association. 2019. Highway Construction Workforce Partnership Summary of Activity.

Link: <http://www.acpa.org/wp-content/uploads/2019/11/Highway-Construction-Workforce-Partnership.pdf>

Keywords: Similar Sector, Highway Construction, Workforce Development

This document highlights recent activities from the six states and six localities that are a part of the Highway Construction Workforce Pilot Project.

State participant activities include: Connecticut “Building Pathways” program which emphasizes construction job training with a focus on working with the trade unions to create trades curriculum for high school students; Rhode Island “Rhoda Island Building Futures Program” which is a seven week online and classroom training program geared to engage women in the construction industry; Alabama created highway construction workforce curriculum to be delivered at three community colleges; Idaho secured grant funding for construction trades training; Arizona “Arizona at Work” program developed a one week long “Industry Readiness” training for potential highway construction workers, 64 have completed the training so far; and South Dakota conducted pilot outreach and recruitment to reservations.

Local participant activities include: Pittsburg developed a construction career awareness computer application called “Future Road Builders” which introduces users to jobs and apprenticeship programs, more than 5000 people have downloaded the application; Atlanta conducted needs assessments and is planning to collaborate with colleges, trade unions, and others to identify training outlets; Dallas saw efforts from the Dallas Regional Black Contractors Association which had a three week construction training program increase to five weeks with a focus on working with second chance candidates, also the

“Opportunity Youth” program which is looking to work with multiple trades to find common career pathways; Denver workforce development collaborated with Colorado Department of Transportation to plan for the I-70 project; St. Louis is working to identify potential partner organizations and transportation to get workers to and from the job site; and Los Angeles is developing apprenticeship programs for two construction projects, they have identified the need for around 2,000 apprentices.

Guidebook for Recruiting, Developing, and Retaining Transit Managers for Fixed-Route Bus and Paratransit Systems

Citation: Anderson, L., Cronin, C.B., Fien-Helfman, D., Pohl, M., Cronin, B., Lazaro, R., Lazaro, V., Singleton, A. 2010. *Guidebook for Recruiting, Developing, and Retaining Transit Managers for Fixed-route Bus and Paratransit Systems*. Transit Cooperative Research Report No. 139. Transportation Research Board.

Link: <http://www.trb.org/Publications/Blurbs/164036.aspx>

Keywords: Similar Sector, Public Transportation, Workforce, Training

This guidebook explores resources for fixed-route bus, general public demand response, and Americans with Disabilities Act (ADA) paratransit systems to assist in the recruitment, development, and retention of managers. This guidebook is designed primarily to address the needs of rural and small urban transit systems, but larger transit systems may find the information helpful. The guidebook is divided into three sections: (1) recruitment recommendations, (2) training and development recommendations, and (3) retention recommendations. Recruitment recommendations include: advertise openings through transit-specific channels, use online recruitment techniques, match recruitment sources to the type of candidate desired, conduct a compensation study, highlight employee benefits, recruit internally for management positions, recruit nontraditional applicants, use a panel or multiple interviewers, utilize behavioral-based job relevant interview protocols, and incorporate realistic job previews. Training recommendations include leveraging existing training opportunities, exploring available funding for training, identifying online resources, make training easy to access, institute mandatory training for managers, address training needs in conjunction with performance appraisals, offer tuition reimbursement, emphasize ongoing professional development at all levels, and implement succession planning. Retention recommendations include: offer competitive benefits, offer flexible work schedules, implement an awards program for high performers, spend time up front hiring high quality managers, establish person-organization fit, provide training and development opportunities, engage managers in developing and supporting the mission, build a culture of ownership, and create a positive organizational culture. Appendices to the guide also include a checklist for transit manager recruitment, training, and retention, and a summary of 20 case studies.

Training, Knowledge Retention and Succession Planning

Developing Transportation Agency Leaders

Citation: National Academies of Sciences, Engineering, and Medicine. 2005. *NCHRP Synthesis 349: Developing Transportation Agency Leaders: A Synthesis of Highway Practice*. Washington, DC. The National Academies Press.

Link: <https://doi.org/10.17226/23300>

Keywords: State Agency, Leadership, Succession Management, Recruitment, Training

The purpose of the synthesis was to document leadership development practices related to hiring, development, evaluation, and retention of leaders in both the public and private sectors. Surveys were

distributed to transportation agencies focused on demographics, recruitment and retention, leadership training, and succession management practices. The survey found that state DOTs are attempting to identify potential leadership in the recruitment and hiring process, but do not feel able to address major retention issues – such as private sector competition and wage gaps. The survey also found that most DOTs offered leadership training programs, but do not have full control over the resources needed to advance these programs, and program ratings show much opportunity for improvement. States implementing formal rather than informal succession management programs received higher effectiveness scores, and overall succession management programs could be better prioritized within DOTs. Leadership and succession management programs at private sector companies provide a role model, as they were found to be better defined and rigorous than at their public sector counterparts.

Culture of Progressive Longitudinal Training in the Public Transit Industry

Citation: Bart, E. and A. Reep. 2013. "Culture of progressive longitudinal training in the public transit industry: a contemporary model." *Transportation Research Record: Journal of the Transportation Research Board* 2328: 40-46.

Link: <https://journals.sagepub.com/doi/abs/10.3141/2328-06>

Keywords: Similar Sector, Public Transportation, Workforce Development, Training

Professional and workforce development is important to maintaining the safe and reliable operational integrity of the public transportation industry in the United States. Typically, trainings are provided to new employees and only intermittently after hire. Longitudinal training refers to progressive career training and professional development of employees. Longitudinal training supports career-long learning and can assist people in defining a meaningful career direction. This paper discusses longitudinal training and its benefits, influences, challenges, examples, and culture. Additionally, these factors are directly associated with new advances in technology, educational techniques, paradigms, and strategies for workforce and professional development.

Workforce Development and Succession Planning to Prepare the Rural Transit Industry for the Future

Citation: Peterson, D. and T. Rieck. 2016. *Workforce Development and Succession Planning to Prepare the Rural Transit Industry for the Future*. National Center for Transit Research.

Link: <https://rosap.ntl.bts.gov/view/dot/31278>

Keywords: Similar Sector, Public Transportation, Workforce Development, Succession Planning

With an aging workforce and major technological advances, there is a need to invest in workforce development in the public transportation industry. In this report, Peterson & Rieck surveyed small urban and rural transit agencies receiving FTA Section 5311 funding. They found that most transit managers had been in the industry for 15 years, and 75 percent of all respondents were aged 50 or older. Only 15 percent of respondents had any succession planning in place to handle potential retirements. Common succession plan strategies included mentoring and one-on-one training. Peterson and Rieck identified numerous potential training opportunities that could be utilized by transit agencies from many professional organizations including American Public Transportation Association, Center for Transportation e-Learning, Easter Seals Project Action, Federal Transit Administration, etc. In particular the authors focus on web-based training opportunities which could be less time consuming. The survey results showed that newer managers could use training on transit principles whereas more experienced managers could use training in leadership, business plan development, and emergency management.

Anticipating and Responding to Changes in the Mobility Sector

Citation: Lambert, L., Roark, I. 2019. Anticipating and responding to changes in the mobility sector. In T. Reeb (Ed.), *Empowering the New Mobility Workforce*. Elsevier.

Link: <https://doi.org/10.1016/B978-0-12-816088-6.00005-5>

Keywords: Applied Technology, Community College, Workforce Development

Pima Community College in Arizona offers programs related to truck driver training, automotive technology, logistics, supply chain management, and aviation technology. The college is seeking to become a part of a community of practice that prepares students for economic and workforce changes occurring in response to new digital technologies and automation. College enrollments reveal a median age of 28-30 years for applied technology programs, indicating a “lost decade” when high school graduates meander in the low paying jobs before returning to school in search of higher wages and stability. Two strategies Pima is implementing to address the gap are: Career and Technical Education (CTE) dual-credit academies to maximize college credits earned during high school and prior learning assessment (PLA) to offer course credit for work-based experience and skills gained. Pima is also developing Centers of Excellence (CoE) that establish teams, shared facilities, and training/support in set focus areas. The CoE model ensures that programs engage with industry to quickly adapt to changing needs. Pima’s partnership with TuSimple, an autonomous vehicle company that is developing a truck driving solution in Tucson, provides an example. They are working with Pima to develop a truck driver training program that anticipates future changes – integrating more coding and programming skills as well as an understanding of logistics into course outcomes.

Transportation Workforce Development at Community Colleges

Citation: Glitman, K. 2010. Transportation Workforce Development at Community Colleges. University of Vermont Transportation Research Center, March 2010.

Link: http://www.uvm.edu/~transctr/research/trc_reports/UVM-TRC-10-002.pdf

Keywords: Community Colleges, Workforce Development, Transportation

The University of Vermont conducted a survey with the American Association of Community Colleges (ACC) to quantify existing community college education programs and partnerships that prepare students for transportation careers. Researchers found that most schools offer programs that are transferable to the transportation sector, including general skills areas such as finance, technology, or maintenance. Curricula specific to transportation tended to be in technical areas like engineering. Most schools reported strategic partnerships with government agencies and private companies to support transportation-related programs. The report lays out recommendations for community colleges seeking to expand transportation-related training. Recommendations include establishing formal advisory boards with industry representatives; enhancing existing programs with transportation-specific concepts and skills; cultivating pre-college interest through K-12 outreach; and engaging industry to provide mentorship and internships. Recommendations to the US Department of Transportation to stimulate workforce development efforts include establishing a common language and job definitions for transportation occupations; promoting partnerships with transportation organizations to identify needs; conducting research to assess demand for transportation sector workers; and sponsoring new education program development.

Indiana Workforce Development Program Guidelines

Citation: Indiana Department of Transportation. 2010. *Highway Technician Program Guidelines*.

Link: <https://www.in.gov/indot/files/HighwayTechnicianProgramGuidelines.pdf>

Keywords: Training Program, Highway Technician, Guidelines

This report highlights the guidelines for the Indiana Department of Transportation Highway Technician Training Program. The program was created to develop highway technicians into fully skilled and trained employees in one of four specialty areas; (1) construction; (2) testing; (3) traffic; (4) highway maintenance. Each specialty area has a specific curriculum. There are three levels of highway technician with salary ranging from \$21,944 to \$42,744. In order to advance to the next level of highway technician a person must apply and be interviewed, then subject to a six-month probationary period.

Oregon On-the-Job Apprenticeship Program

Citation: Oregon Department of Transportation. 2020. *Workforce Development – How to Start a Construction Career*. Accessed: <https://www.oregon.gov/odot/Business/OCR/Pages/Workforce-Development.aspx> [Accessed On: 22 April 2020].

Link: <https://www.oregon.gov/odot/Business/OCR/Pages/Workforce-Development.aspx>

Keywords: Training Program, On-the-Job Training, Apprenticeship

The Oregon Department of Transportation has set the goal to recruit and retain a skilled and diverse highway construction workforce. As a part of this effort, ODOT has created the on-the-job training and apprenticeship program which aims to increase minority and women in the industry. This program builds skills necessary to maintain a job in the highway construction industry. ODOT and the Oregon Bureau of Labor and Industries (BOLI) partnered to improve apprenticeship numbers and provide resources including training classes to prepare for an apprenticeship, resources to help pay for child care and travel costs for apprentices, and training to create respectful workplaces. ODOT has also developed numerous career awareness videos related to construction apprenticeship programs including cement masons, operating engineers, and laborers.

Philly Future Track – Put Your Future on a New Track

Citation: Streets Philadelphia. 2020. *Philly Future Track – Put Your Future on a New Track – Program Overview*. Accessed: <https://www.philadelphiastreet.com/phillyfuturetrack/> [Accessed On: 22 April 2020].

Link: <https://www.philadelphiastreet.com/phillyfuturetrack/>

Keywords: Training Program, On-the-Job Training, Local

Philly Future Track is a program that provides on-the-job skills training and experience to help create skilled employees for jobs with the City of Philadelphia and other employers in the region (though full-time employment is not guaranteed upon completion). Philly Future Track is a 5-month program, where participants work in teams on cleaning, transportation, and sanitation related projects while receiving training and direct experience with City and non-City employees. This program offers two tracks: one related to neighborhood beautification and one focused on roadway maintenance. The roadway maintenance track allows participants to learn how to use specialized tools and equipment.

Rutgers CAIT is Using VR to Make Workforce Training Safer and More Efficient

Citation: Rutgers Center for Advanced Infrastructure and Transportation. 2019. *Rutgers CAIT is Using VR to Make Workforce Training Safer and More Efficient*.

Link: <https://cait.rutgers.edu/rutgers-cait-is-using-vr-to-make-workforce-training-safer-and-more-efficient/>

Keywords: Training Program, Virtual Reality

Dr. Jie Gong, an associate professor at Rutgers Center for Advanced Infrastructure and Transportation, led efforts to develop fully interactive virtual reality (VR) environments to train roadside crews in various activities including bridge inspection and work zone safety. The VR environment allows participants to gain hands-on experience in a safe manner. The hope is that in the future this technology can be a cost effective and safe way to train new workers.

Recent News Articles

New Highway Maintenance Degree Aims To Help Build Transportation Workforce

Link: <https://aashtojournal.org/2019/01/04/new-highway-maintenance-degree-aims-to-help-build-transportation-workforce/>

The article describes the impetus for a new associate's degree program in highway maintenance management, which was scheduled for launch by Front Range Community College in January 2019. The program is offered online and is expected to draw 400 students annually nationwide. The degree program was initiated by Colorado DOT's division of highway maintenance and content crafted with input from public works associations and agencies and the Colorado Local Technical Assistance Program. The Construction Academy, a pre-apprentice training program launched by the Arizona DOT, is focused on attracting women and minorities to road construction occupations. Since it began in 2014, 35 percent of the 600 graduates are women.

How UC's Snowplow Simulator Could Help ODOT with a Driver Shortage

Link: <https://www.wcpo.com/news/transportation-development/move-up-cincinnati/how-ucs-snowplow-simulator-could-help-odot-with-a-driver-shortage>

University of Cincinnati students are using virtual snowplow simulators to study the impact of snow on roadways from the snowplow operator's perspective. The hope is that this simulator could be a safe and effective way to train snowplow operators during any time of the year. Through a grant from Ohio Department of Transportation, the simulator is now housed in a trailer and the three-year research project and pilot program will use the simulator to teach snowplow operators how to operate the plow and how to handle adverse weather conditions. Ohio Department of Transportation has been looking to new ways to train drivers as they are hiring around 350 new snowplow operators each winter.

Wages and Benefits

Employee Compensation Guidelines for Transit Providers in Rural and Small Urban Areas

Citation: KFH Group. *Employee Compensation Guidelines for Transit Providers in Rural and Small Urban Areas*. Transit Cooperative Research Program Report 127. Transportation Research Board, 2008.

Link: <http://www.trb.org/Publications/Blurbs/160065.aspx>

Keywords: Similar Sector, Public Transportation, Guidebook, Rural and Small Urban, Workforce

This guidebook provides guidelines on employee compensation for rural and small urban transit managers to support wage and benefit decision-making. It also provides information on attracting and retaining qualified employees. An interactive computer tool accompanies the guidebook. This tool provides a way for transit managers to quickly explore salary and benefit data from transit systems in

rural and small urban areas. This guidebook is divided into four sections: (1) introduction, (2) wage and benefits data, (3) guide to compensation decisions, and (4) recruiting, hiring, and retaining staff.

The guide to compensation decisions encourages employers to consider compensation as a package of both financial and non-financial benefits to employees. Organizations should consider systems goals and expectations when making compensation decisions, taking into consideration that employment of part-time employees without benefits can reduce service quality and increase recruitment, training, and new hire expenses. Wage setting should take into consideration internal equity within organizations, market pricing within local labor markets, and peer analysis of similar jobs regionally. Categorizing job categories and functions is an important piece of wage assessment. Recruitment strategies should focus on establishing the organization as an employer of choice by working to: recruit the right people, hire best applicants, train staff for success, continue to develop staff, provide a positive work environment, provide fair compensation, recognize staff worth, and provide growth opportunities.

Promoting Diversity

Navigating the Transportation Industry Workforce Shortage and Leadership Gap – The Solution is Hiding in Plain Sight

Citation: Jones, D.W. 2019. *Navigating the Transportation Industry Workforce Shortage and Leadership Gap – The Solution is Hiding in Plain Sight*. ENO Center for Transportation, Aug. 27, 2019

Link: <https://www.enotrans.org/article/navigating-the-transportation-industry-workforce-shortage-and-leadership-gap-the-solution-is-hiding-in-plain-sight/>

Keywords: Recruitment, Diversity

Over the next 10 years almost half of the transportation industry workforce is eligible for retirement. This will create a loss in leadership and skilled professionals in the industry. This loss combines with recent changes in the industry including emerging technologies, lack of funding, aging infrastructure, and current workforce shortages. These changes have created an opportunity to hire a more diverse workforce, whereas previously women and minorities were historically underrepresented in the transportation industry. While some organizations like the American Public Transportation Association and Transportation Research Board have made strides in focusing on diversity, there is a need to create a sense of belonging for diverse individuals in the transportation industry.

Building a Business Case for Increasing Diversity in the Transportation Workforce

Citation: Ivey, S., Powers, M., Clark, A. 2019. *Building a Case for Increasing Diversity in the Transportation Workforce*. TR News, September – October 2019.

Link: <http://onlinepubs.trb.org/onlinepubs/trnews/trnews323BusinessCase.pdf>

Keywords: Diversity, Performance, Recruitment

Given the demographic trends shaping the nation's workforce, increasing transportation workforce diversity is presented as crucial not just for meeting staffing needs but for improving transportation organizations' performance and maintaining global competitiveness. The authors' definition of diversity encompasses a wide variety of measures to include gender, age, race, ethnicity, orientation, socioeconomic status, and neurodiversity. Research is cited, which correlates diverse workforces with increases in efficiency, innovation, profitability and improved decision-making. A 20 percent threshold for women in an organization's leadership is cited as necessary to realize improvements in innovation performance. Diverse workplaces are also better able to recruit new workers as 65 percent of job

seekers identify diversity as a critical factor. Although women now make up 47 percent of the total workforce, the transportation industry remains male-dominated, with women making up less than 20 percent of workers in primary transportation occupations. Strategies identified for increasing diversity in transportation organizations include leadership that clearly articulates and prioritizes diversity and inclusion goals; engagement with underrepresented groups, for example through internship programs; and policies that address wage gap and work-life balance concerns.

Practical Resources for Recruiting Minorities for Chief Executive Officers at Public Transportation Agencies

Citation: Washington, E., J. Johnson, B. McCloskley, P. Toliver, M. Simon, R. Simon, M. Ford, C. Washington, C2EW Consulting. 2011. *Practical Resources for Recruiting Minorities for Chief Executive Officers at Public Transportation Agencies*. Transit Cooperative Research Program Report 148. Transportation Research Board.

Link: <http://www.trb.org/Publications/Blurbs/166310.aspx>

Keywords: Similar Sector, Public Transportation, Workforce, Diversity

This report introduces strategies to recruit minorities for chief executive officer (CEO) positions and provides resources to assist governing boards of public transportation agencies in the recruitment of minority CEOs. This report addresses key issues and concerns, describes best practices, recruitment initiatives, and actions used by boards and executive search firms to recruit minorities for the CEO position at public transportation agencies. The literature review provides many examples that link diversity to greater return on investment. CEO diversity recruitment models presented include utilizing a combination of internal and external executive recruitment methods; creation of diversity executive recruitment programs; requiring a mandatory diverse talent pool for all interviewees; leveraging professional associations; and utilizing extensive internet searches. Hiring practices include utilizing candidate assessment instruments that focus on leadership competencies. Effective retention strategies include providing structured executive coaching programs, mentoring, and on-boarding processes.

Attracting and Retaining Women in the Transportation Industry

Citation: Godfrey, J. and R. Bertini. 2019. *Attracting and Retaining Women in the Transportation Industry*. Mineta Transportation Institute.

Link: <https://transweb.sjsu.edu/sites/default/files/1893-Godfrey-Attract-Retain-Women-Transportation.pdf>

Keywords: Gender, Females, Labor Force, Recruitment, Transportation

The report provides background information on the current state of female participation in the labor market and as a portion of the transportation industry labor force. While women accounted for 47.5 percent of the US workforce in 2017, their participation in transportation occupations was only 14.6 percent. The Women's Bureau defines nontraditional occupations as ones where less than 25 percent of the workforce is women. On the other hand, while STEM careers are increasingly valued, women's attainment of at least a bachelor's degree surpassed that of men in 2016.

The report summarizes findings from literature on attracting, promoting, and retaining women in the transportation industry. A McKinsey & Company study recommends organizations make a compelling case for diversity, invest in employee training, and ensure hiring, review, and promotion process are clear and fair. A report on transportation workforce issues cites unattractive industry perceptions and inadequate career development opportunities as problematic in increasing diverse workers. Increasing

connections with young people, networking, and participation in professional organizations were cited as important for attracting women to the industry. Offering flexibility in scheduling, work-life balance, mentorship, and leadership advancement were all identified as strategies to increase diversification and retention. Organizational culture was also identified as important, in particular, highlighting communal goals that can be accomplished through transportation. Focusing on culture change through training or other methods to ensure diversity inclusion is valued organization-wide can improve perception of the organization. Recommendations for promoting and retaining women in the industry include developing defined and unbiased succession plans; conduct recurring surveys to assess effectiveness of diversity efforts; establish family friendly policies; and promote culture change at every level of the organization.

Attracting, Retaining, and Advancing Women in Transit

National Academies of Sciences, Engineering, and Medicine 2020. *Attracting, Retaining, and Advancing Women in Transit*. Washington, DC: The National Academies Press.

Link: <https://doi.org/10.17226/25741>

Keywords: Similar Sector, Public Transportation, Women, Workforce Development

The report synthesizes data obtained through a literature review, transit agency surveys, and case study interviews to illustrate strategies currently being employed by transit agencies to attract, retain, and advance a greater number of women employed in transit occupations. Women are currently underrepresented in transit jobs, particularly in leadership positions. Strategies identified within each category are summarized below.

Attracting women to transit jobs:

- Conduct outreach in schools;
- Communicate about transit careers in community;
- Improve image of transit careers;
- Focus on recruiting women and outline specific goals;
- Incorporate imagery or messaging of women in transit;
- Develop internships, apprenticeships, etc. with focus on women;
- Review current hiring practices for bias.

Retaining women in transit agencies:

- Address culture change;
- Improve organizational policies regarding safety and health concerns;
- Provide training and development support;
- Initiate networking opportunities;
- Improve accommodations for responsibilities outside of work.

Developing/advancing women in transit careers:

- Provide mentoring and networking opportunities;
- Outline career development pathways;
- Consider work assignment equality.

The listed strategies were identified to address barriers identified that keep women from entering or advancing in transit careers. These barriers include gender-biased industry image or career messaging; safety and health concerns applicable to women; lack of outreach and promotional strategies focused on women; and challenges with work-life balance.

Outsourcing/Contracting

Outsourcing Expert Services by State Transportation Departments: A Look at Effects on Cost, Quality and Changing Employment Levels

Citation: Yusuf, J-E., O’Connell, L. 2014. *Outsourcing Expert Services by State Transportation Departments: A Look at Effects on Cost, Quality and Changing Employment Levels*. ODU Digital Commons.

Link: <https://pdfs.semanticscholar.org/214f/fe609d25a8030290122a99375931296ba376.pdf>

Keywords: Outsourcing, State DOT, Expert Services

There has been an increase in government departments contracting with private sector firms for public goods and services as more government departments deal with limited resources. But as privatization becomes more common (previous research found that 85 percent of state DOTs used consultants to perform some construction engineering or inspection work), there are questions of whether it actually reduces costs. Some studies have found that outsourcing can result in increased costs and lower quality work. In fact, contract management alone can raise costs upwards of 20 percent above in-house levels. There are additional concerns that outsourcing can also cause a reduction in an organization’s ability to perform skilled work. In this paper, Yusuf & O’Connell surveyed 30 state DOTs and used US Census employment data to gain an understanding of the costs and benefits of outsourcing. Most respondents were outsourcing some agency activities and on average found no cost savings and only small improvements in quality of service. State DOTs were more likely to outsource “core functions” like planning and design versus things like traffic operations or equipment purchasing.

Outsourcing Versus In-house Highway Maintenance: Cost Comparison and Decision Factors

Citation: Dlesk, R., and Lansford, C.B. 2006. *Outsourcing versus In-house Highway Maintenance: Cost Comparison and Decision Factors*. SCDOT Research Project 653: Maintenance Outsourcing. Clemson University, April 2006.

Link: <https://www.scdot.scitap.org/wp-content/uploads/2017/05/SPR-653.pdf>

Keywords: Outsourcing, Highway Maintenance

A wide range of maintenance activities are being outsourced by state agencies. The South Carolina Department of Transportation (SCDOT) uses a combination of in-house and contracted highway maintenance. The researchers explored the relative costs and the subjective advantages and disadvantages for outsourcing maintenance work through a literature review, state agency surveys, workshops with district officers, surveys of maintenance contractors, and analysis of contract cost data.

The literature review found mixed reviews from state DOTs regarding satisfaction with outsourced maintenance activities. Reasons for outsourcing include limited in-house resources; need for specialized expertise or equipment; improved quality; statutory requirements or agency policies; seasonality of work; and contractor availability. Trade-offs include availability of data for accurate cost comparisons, cost, and availability of internal expertise for contract administration. Survey results from 13 state DOTs revealed mixed satisfaction ratings for contracted maintenance work. Most common reasons for

outsourcing maintenance work were lack of equipment within the DOT and expansion of maintenance workloads. SCDOT district workshops discussed decision factors for considering outsourcing for a range of maintenance activities, to include SCDOT personnel and equipment availability, expertise of contracting firms, ability of contractors to provide quality work, and contract administration issues. Available resources varied between districts, indicating that blanket mandates dictating specific outsourcing activities statewide would not be in SCDOT's best interest.

The researchers analyzed 20 maintenance-related activities in South Carolina in FY 2003-2004 to examine in-house versus outsourcing costs associated with each activity. Researchers were unable to compare all maintenance operations. However, for drainpipe installation, mowing, sign installation, and full depth patching, in-house and out-sourcing unit costs were found to be comparable.

Career Messaging

"I See Myself in that Career": Exploring Methods to Attract the Next Generation Transportation Workforce

Citation: McFadden, M., Ullman, H., McRae, G. 2019. *"I See Myself in that Career": Exploring Methods to Attract the Next Generation Transportation Workforce. A Research Report from the National Center for Sustainable Transportation.* University of Vermont Transportation Research Center.

Link: <https://escholarship.org/uc/item/82r0k1ch>

Keywords: Attraction, Career Messaging, Career Awareness

To address a shortage of transportation workers, initiatives aimed at increasing the future talent pipeline into transportation careers have proliferated, some of which focus on increasing career awareness about transportation careers among young people. The authors hypothesize that in attracting diverse new entrants to the industry, first-person and dynamic glimpses of the experiences and values of current workers is essential in building connections and engaging future entrants. The report outlines a pilot effort to develop a pool of career story profiles that showcase different transportation professional roles to build connections with young people from similar backgrounds. These career story profiles can help create awareness of a particular career; spark a relational interest; and help individuals become aware of which careers best contribute to the growth of their knowledge, skills, and abilities. University of Vermont's career profile pilot focused on environmental careers within transportation. Each profile was designed to include: 1) an individual profile and interview; 2) an overview of the individual's organization; 3) a job description; 4) an overview of the wider "field;" 5) examples of projects; 6) links to national organizations or resource groups; and 7) skills and requirements necessary to fulfill the job. The profiles were intended to provide clear occupational and career pathway information and guidance on needed abilities to be successful. The authors note that as development of in-depth profiles and stories grow as a workforce attraction strategy, efforts need to ensure that they are made accessible to a wide and diverse audience and metrics need to be developed to track their effectiveness.

Performance Management

A Methodology for Performance Measurement and Peer Comparison in the Public Transportation Industry

Citation: Ryus, P., K. Coffel, J. Parks, V. Perk, L. Cherrington, J. Arndt, Y. Nakanishi, A. Gan. 2010. *A Methodology for Performance Measurement and Peer Comparison in the Public Transportation Industry.* Transit Cooperative Research Program Report 141, Transportation Research Board.

Link: http://www.tcrponline.org/PDFDocuments/TCRP_RPT_141.pdf

Keywords: Similar Sector, Public Transportation, Performance Measurement

This report describes research into the development and testing of a methodology for performance measurement and peer comparison for transit. The performance measurement and peer comparison methodology described in this report incorporates nationally available, standardized factors into the peer selection process and describes ways for incorporating policy objectives and other factors into the process. It will be of interest to individuals interested in using performance measurement and benchmarking as tools to 1) identify the strengths and weakness of their organizations; 2) set goals or performance targets; and 3) identify best practices to improve performance.

Asset Management

Asset Management Guide for Small Providers: Focusing on the Management of Our Transit Investments

Citation: Roberts, C., T. Batac, and M.-A. Akofio-Sowah. 2016. *Asset Management Guide for Small Providers: Focusing on the Management of Our Transit Investments*. No. FTA Report No. 0092.

Link: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/FTA0092_Research_Report_Summary.pdf

Keywords: Similar Sector, Public Transportation, Asset Management, Guidebook

This guide describes what Transit Asset Management (TAM) means for small transit providers and provides insight for developing TAM plans to improve the management of transit assets while meeting the Federal requirements set forth in Moving Ahead for Progress in the 21st Century (MAP-21) and subsequent FTA rulemaking. This guide is not intended to be a step-by-step guide but rather provides guidance for good practice asset management based on a review of industry standards and practices. The guide provides an introduction on TAM and TAM plans for small providers as well as a link to a menu-driven master template to assist in developing MAP-21 compliant TAM plans.

Additional Documents

The follow reports and journal and new articles were identified throughout the project as relevant but were not referenced in the main body of the report.

Adams, M.H. Maintaining the System: Defining Routes for Advancement for the Highway Maintenance Workforce. TR News 323, Sep.-Oct. 2019, pg. 38. <http://www.trb.org/Main/Blurbs/180431.aspx>

Altman, M. "Looking Ahead: the 117th Congress and the Public Works Workforce." The APWA Reporter. January 2021, pg. 32-33.

PennDOT Seasonal Winter Employment Opportunities Flier,
<http://www.dot.state.pa.us/public/PubsForms/Publications/PUB%20809W.pdf>

NCHRP. Advances in Developing A Cross-Trained Workforce. NCHRP Project 20 68A, Scan 13-01. AASHTO, August 2016.

Conclusions

The literature review identified 49 documents related to workforce development challenges and strategies to address these challenges in the transportation industry. Twenty-nine (29) of these documents were published within the last five years suggesting that this is an area of need and timely

issue in many transportation sectors. This literature review identified many ongoing workforce development challenges faced in the transportation industry including generational differences, upcoming retirements, emerging technologies, knowledge and skills gaps, and forecasting needs. Potential strategies to address these challenges included promoting recruitment and retention, knowledge retention and succession planning, examining wages and benefits, promoting diversity, outsourcing or contracting, performance management, and asset management. The literature shows that there is no “one size fits all solution” to the workforce challenges faced by the transportation industry, instead a variety of methods have been utilized including the creation of career pathways into the industry, on-the-job training programs, mentorship programs, unique training methods including online and virtual reality, and methods to promote the benefits of entering the transportation industry.

APPENDIX B – DETAILED SURVEY RESULTS

Human Resources Manager Survey

Respondent Information

This survey had a total of 9 respondents. The first question asked respondents to provide information on their agency and job title (Table 1).

Table 1. Respondent Agency and Position

Title/Position	Agency
Infrastructure Services Personnel Officer	Department of Public Works, City of Milwaukee
Human Resources Developer- Training Specialist	MI Dept of Transportation
Deputy HR Director	MnDOT
Staffing Manager	MnDOT/Office of Human Resources
Administrator, HR	NH DOT
Bureau Administrator	NHDOT
Recruitment Manager	North Dakota Department of Transportation Human Resources
Program Analyst 3	PA Department of Transportation (PennDOT)
Program Analyst 3	PA Department of Transportation (PennDOT)
HR Manager	WV Division of Highways

Agency Information

Workforce

Respondents were asked to indicate the number of highway maintenance workers within their agency that were employed last year in each of the following categories: Full-Time, Permanent; Part-Time, Year-Round; Seasonal/Temporary (Winter Season) Workers; Auxiliary/Supplemental Workers from Other Divisions Used as Plow Truck Operators. Eight respondents answered this question (Table 2, Figure 1).

Full-time, permanent workers made up the majority of the highway maintenance workforce. The number of Full-time, permanent workers ranged from 64 to 5,920. Part-time workers and seasonal/temporary workers made up the second largest portion of the highway maintenance workforce with part-time workers ranging from 0 to 400, and seasonal/temporary workers ranging from 1 to 200. Only two respondents (New Hampshire DOT and Pennsylvania DOT) noted using auxiliary or supplemental workers from other divisions.

Table 2. Agency Mix of Worker Types

Agency	Full-Time, Permanent	Part-Time, Year-Round	Seasonal/Temporary (Winter Season) Workers	Auxiliary/Supplemental Workers from Other Divisions Used as Plow Truck Operators
Department of Public Works, City of Milwaukee	134			
MI Dept of Transportation	380		200	
MnDOT	1,424	53	94	Unknown
NH DOT	680	10	10	15
North Dakota Department of Transportation Human Resources	358	0	2	0
PA Department of Transportation (PennDOT)	5,144	1	1	1
PA Department of Transportation (PennDOT)	5,920*	400	150	
WV Division of Highways	64	0	12	

* Respondent noted number includes Union County Managers, Assistant County Managers

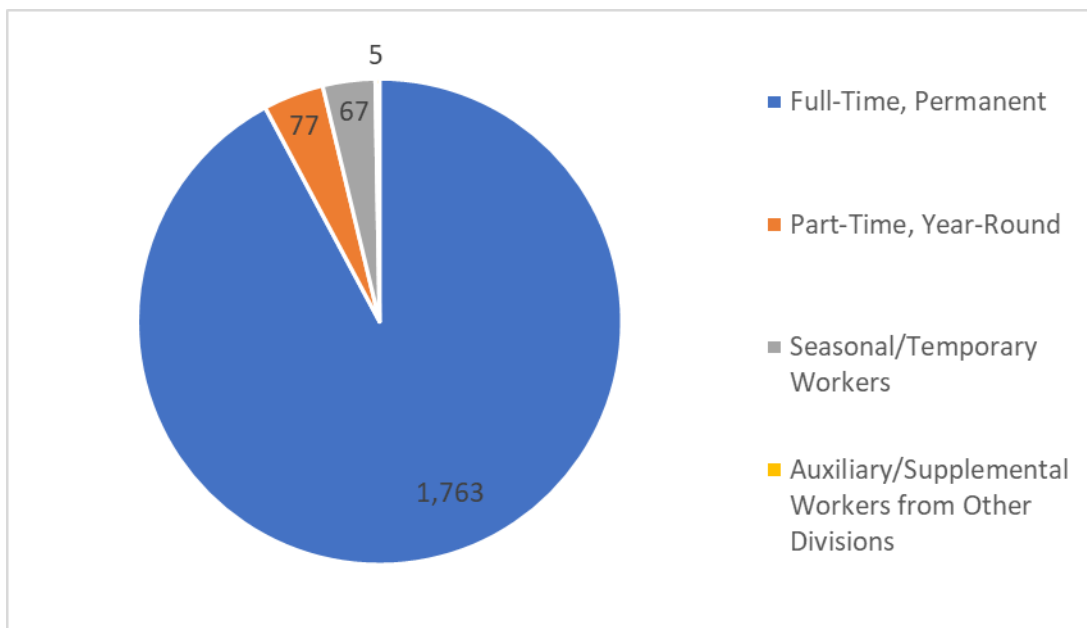


Figure 1. Average Mix of Workers

Worker Shortage

Respondents were asked if their agency experienced a shortage of highway maintenance workers during 2019-2020 winter season, eight respondents provided information on their agency worker shortages. Just over half (62.5%) of the respondents mentioned having a shortage of workers (Table 3). A follow-up question asked for the approximate number of the shortage, on average, respondents noted an average shortage of 53 workers. Worker shortages ranged from 10 (North Dakota DOT) to 80 (Michigan DOT and

New Hampshire DOT) workers. Two agencies did not experience a highway maintenance worker shortage (Pennsylvania DOT and Minnesota DOT).

Table 3. Agency Job Shortages

Agency	Did your agency experience a shortage of highway maintenance workers in winter season 2019-2020?	What was the approximate number of the shortage?
Department of Public Works, City of Milwaukee	Yes	40
MI Dept of Transportation	Yes	80
MnDOT	No	
NH DOT	Yes	80
North Dakota Department of Transportation Human Resources	Yes	10
PA Department of Transportation (PennDOT)	No	
PA Department of Transportation (PennDOT)	No	
WV Division of Highways	Yes	

Current Highway Maintenance Workforce

Respondents were asked to provide the job title, pay range, total number of authorized positions within this classification, and the total number of employees that have maxed out their pay scale for each classification of worker within their agency during the 2019-2020 winter season (up to five positions ranging from entry level to management). Only 5 respondents provided data on their job classifications. In general, as you move up the job classification scale the pay range increased and the total number of employees authorized for the position decreased. There tended to be fewer employees that had maxed out the pay scale in managerial positions when compared to more entry level positions.

Position 1 (Entry Level)

While entry level positions titles and pay ranges were similar, the number of authorized positions and percentage of employees that had maxed out their pay scale varied widely across respondents (Table 4). Position titles ranged from Transportation Technician I to Highway Maintainer I. Hourly pay ranges were fairly similar ranging from a starting pay of around \$15 to \$19 an hour and topping out at \$21 to \$27. There was a wide range of total authorized positions, from just 28 to over 4,000. The percentage of employees that had maxed out the entry level pay scale also widely varied from 0% to upwards of 75%.

Table 4. Position 1 (Entry Level) Characteristics

Agency	Job Classification/Title	Pay Range (Hourly Rate)	Total Authorized Positions in this Classification	% of Employees in this Classification that are Maxed Out in their Pay Scale
MI Dept of Transportation	Transportation Maintenance Work E-6-9	\$17.40-\$27.34		75%
MnDOT	Transportation Associate	\$19.48-\$20.09	61	0
NH DOT	Highway Maintainer I		61	
North Dakota Department of Transportation Human Resources	Transportation Technician I	\$19.72-\$21.89	28	25%
PA Department of Transportation (PennDOT)	Transportation Equipment Operator	\$15.74-\$26.45	4,266	309 (7%)

Position 2

Position 2 titles ranged from Transportation Technician II to Transportation Generalist (Table 5). The entry level pay scale for position 2 ranged from \$14 to \$22 and maxed out around \$23 to \$26. Total authorized positions within this classification ranged from 191 to over 1,300 and the percentage of employees that had maxed out the pay scale in this classification range from just 3% to 57*%.

Table 5. Position 2 Characteristics

Agency	Job Classification/Title	Pay Range (Hourly Rate)	Total Authorized Positions in this Classification	% of Employees in this Classification that are Maxed Out in their Pay Scale
MnDOT	Transportation Generalist	\$20.85-\$26.20	1,351	57*
NH DOT	Highway Maintainer II		250*	
North Dakota Department of Transportation Human Resources	Transportation Technician II	\$21.95-\$26.08	191	9%
PA Department of Transportation (PennDOT)	Highway Maintenance Support Staff	\$13.97-\$23.14	745	19 (3%)

*Based on the response, we are unsure if the respondent meant 57 total number of employees or 57%.

Position 3

Position 3 job titles ranged from Transportation Technician III to Highway Foreman (Table 6). Entry level hourly pay for position 3 had similar ranges from \$20 to \$24 and hourly pay maxed out from \$28 to \$34. The total authorized number of positions in this classification ranged from 54 to 653 and the percentage of employees that had maxed out the pay scale in this position ranged from 11% to 32*%.

Table 6. Position 3 Characteristics

Agency	Job Classification/Title	Pay Range (Hourly Rate)	Total Authorized Positions in this Classification	% of Employees in this Classification that are Maxed Out in their Pay Scale
MnDOT	Transportation Ops Supervisor 1	\$24.05-\$36.24	56	32*
NH DOT	Highway Maintainer III		145*	
North Dakota Department of Transportation Human Resources	Transportation Technician III	\$23.05-\$28.71	54	11%
PA Department of Transportation (PennDOT)	Highway Foreman	\$20.00-\$34.43	653	77 (12%)

*Based on the response, we are unsure if the respondent meant 32 total number of employees or 32%.

Position 4

Position 4 is distinctly within the category of “managers” for all agencies (Table 7), job titles ranged from Transportation Services Supervisor I to Assistant Highway Patrol Foreman. The entry level hourly pay for this position ranged from \$24 to \$26 and the hourly pay maxed out around \$38 to \$44. One agency (North Dakota DOT) had zero authorized positions in this category, otherwise the total number of authorized positions within this classification ranged from 86 to 196 and the percentage of employees that had max out the pay scale in this classification ranged from 7% to 62*%.

Table 7. Position 4 Characteristics

Agency	Job Classification/Title	Pay Range (Hourly Rate)	Total Authorized Positions in this Classification	% of Employees in this Classification that are Maxed Out in their Pay Scale
MnDOT	Transportation Ops Supervisor 2	\$26.93-\$40.50	86	62*
NH DOT	Asst Highway Patrol Foreman		104*	
North Dakota Department of Transportation Human Resources	Transportation Services Supervisor I	\$24.20-\$38.23	0	0%
PA Department of Transportation (PennDOT)	Assistant County Managers	\$25.84-\$44.83	196	13 (7%)

*Based on the response, we are unsure if the respondent meant 62 total number of employees or 62%.

Position 5 (Managerial)

Job titles within position 5 ranged from Transportation Services Supervisor II to County Manager (Table 8). The entry level hourly pay for this classification ranged from \$25 to \$33 and maxed out around \$42 to \$58. The total number of authorized positions in this classification ranged from just 17 to 93 and the percentage of employees maxed out in their pay scale ranged from 0% to 65*%.

Table 8. Position 5 (Managerial) Characteristics

Agency	Job Classification/Title	Pay Range (Hourly Rate)	Total Authorized Positions in this Classification	% of Employees in this Classification that are Maxed Out in their Pay Scale
MnDOT	Transportation Ops Supervisor 4	\$31.17-\$46.76	17	65*
NH DOT	Highway Patrol Foreman		93*	
North Dakota Department of Transportation Human Resources	Transportation Services Supervisor II	\$25.71-\$41.99	74	0%
PA Department of Transportation (PennDOT)	County Managers	\$33.71-\$58.44	60	12 (20%)

*Based on the response, we are unsure if the respondent meant 65 total number of employees or 65%.

CDL

Respondents were asked if their agency hired highway maintenance workers who did not have a CDL, nine respondents provided information on their hiring practices related to CDL (Table 9). Most respondents (77.8%) answered yes, their agency hired highway maintenance workers who did not have a CDL. A follow up question asked respondents to explain their hiring policies related to CDL. Many agencies have policies that a worker may be hired without a CDL but must obtain one within a specified period of time post-hire (6 months to a year). Two respondents (North Dakota DOT and Minnesota DOT) stated that workers must have a Class B permit upon hire but then can obtain their Class A CDL within a specified time period. Others mentioned that they will hire workers without a CDL to drive a pickup truck with a plow or for other highway maintenance jobs that do not require one. One respondent (Michigan DOT) mentioned that their agency does not hire workers without a CDL and that their policy states all maintenance employee positions require a CDL with either an A or X endorsement.

Table 9. CDL-Related Hiring Policies

Agency	Do you hire highway maintenance workers without CDLs?	Please explain your hiring policy related to CDL
Department of Public Works, City of Milwaukee	Yes	A permit is required, and we help them obtain the full CDL
MI Dept of Transportation	No	All maintenance employees require a CDL with either an A or X endorsement
MnDOT	Yes	Class B Permit and then must attain CDL prior to coming off probation
NH DOT	Yes	Entry level have 1 year to get CDL
NHDOT	Yes	We have an entry level Highway Maintainer I position that allows up to 1 year to obtain a CDL
North Dakota Department of Transportation Human Resources	Yes	Must have their Class B permit on their first day then obtain Class A license within 6 months.
PA Department of Transportation (PennDOT)	Yes	Some of our highway maintenance jobs, such as highway maintenance workers, or tradesman helpers, do not require a CDL
PA Department of Transportation (PennDOT)	No	Some of our highway maintenance jobs, such as highway maintenance workers, or tradesman helpers, do not require a CDL
WV Division of Highways	Yes	They can only drive a pickup truck with a plow

An additional follow-up question asked if their agency would help staff acquire a CDL. Only 5 respondents answered this question. Just over half (60%) stated that their agency would help staff obtain a CDL.

Job Vacancy

Respondents were asked to provide the average job vacancy duration in calendar days within their agency. Respondents answers varied widely to just 14 days to fill a job vacancy to 90 days (Table 10). The average job vacancy duration in calendar days is 52 days.

Table 10. Average Job Vacancy Duration

Agency	Average Vacancy Duration (in calendar days)
MI Dept of Transportation	30 days
MnDOT	40
NH DOT	75
North Dakota Department of Transportation Human Resources	14 days
PA Department of Transportation (PennDOT)	60-90 days
PA Department of Transportation (PennDOT)	Approximately 60-90 days

Respondents were asked how many unfilled highway maintenance worker vacancies their agencies had during the 2019-2020 winter season (Table 11). The number of unfilled worker vacancies ranged from 0 (Minnesota DOT) to 200.

Table 11. Unfilled Worker Vacancies (2019-2020 Winter Season)

Agency	How many unfilled highway maintenance worker vacancies did your agency have over winter 2019-2020?
MI Dept of Transportation	Seasonal – approximately 80
MnDOT	0
NH DOT	75
NHDOT	80
North Dakota Department of Transportation Human Resources	10
PA Department of Transportation (PennDOT)	Approximately 200: this is maintained to facilitate quick filled for emergency contingencies – it does not necessarily represent difficulty in filling positions

Union

Most agencies (71.4%) had unionized highway maintenance workers.

Retirement

Respondents were asked what percentage of their highway maintenance workforce would be eligible for retirement within the next 5 years. Percentages ranged from 22% to 38% with an average of 25% of the workers being eligible for retirement within the next 5 years.

Worker Benefits

Respondents were asked to provide information on the types of benefits that their agency provided to full-time, highway maintenance workers, seven respondents answered this question (Figure 2). All respondents offered their employees paid sick leave, paid holidays, medical insurance, dental insurance, life insurance, eye care, over time pay, holiday pay, wellness exams, and bereavement leave. Paid vacation time, state or other public pension plans, paid military leave, and shift differentials were common (85.7% of respondents). Transportation subsidies for commuting to work were not offered by any respondents and similar reimbursements for obtaining a CDL or meals were not common. Two respondents stated that they offered other benefits that were not listed. These other benefits included funeral leave, comp time, CARES Act leave, longevity bonuses, leadership development opportunities, and infant at work programs.

Table 12. Benefits Provided

Benefit Type	Benefit	Total Respondents	Percentage of Total Respondents (N=7)
Paid Leave	Paid Time Off (PTO)	3	42.9%
	Paid vacation leave	6	85.7%

	Paid sick leave	7	100.0%
	Paid Holidays	7	100.0%
	Other (please specify)	2	28.6%
Retirement Benefits	State or other public pension plan	6	85.7%
	Employer-matched deferred compensation	4	57.1%
	Deferred compensation without match	3	42.9%
	Other (please specify)	0	0.0%
Employer-Subsidized Insurance Benefits	Medical	7	100.0%
	Dental	7	100.0%
	Life	7	100.0%
	Eye care	7	100.0%
	Long-term care	5	71.4%
Other Employee Benefits	Comp time	5	71.4%
	Flex time	3	42.9%
	Call-in minimum	5	71.4%
	Snow duty bonus	2	28.6%
	Over time	7	100.0%
	Double over time	2	28.6%
	Stand by pay	2	28.6%
	Holiday pay	7	100.0%
	Shift differential	6	85.7%
	Special duty or work out-of-class pay	4	57.1%
	Health savings account	3	42.9%
	Payroll savings plan	2	28.6%
	Wellness exams	7	100.0%
	Transportation subsidy for commute	0	0.0%
	Deferred compensation program	5	71.4%
	Bereavement leave	7	100.0%
	Military leave, paid	6	85.7%
	Meal reimbursements/meal provided	1	14.3%
	Work clothing/uniforms	2	28.6%
	PPE provided	6	85.7%
	Reimbursement for CDL	1	14.3%
	Tuition reimbursement	2	28.6%
	Paid attendance at professional conferences/events	3	42.9%
	Paid training for certifications/certificates/CEUs	5	71.4%
	Other (please specify)	2	28.6%

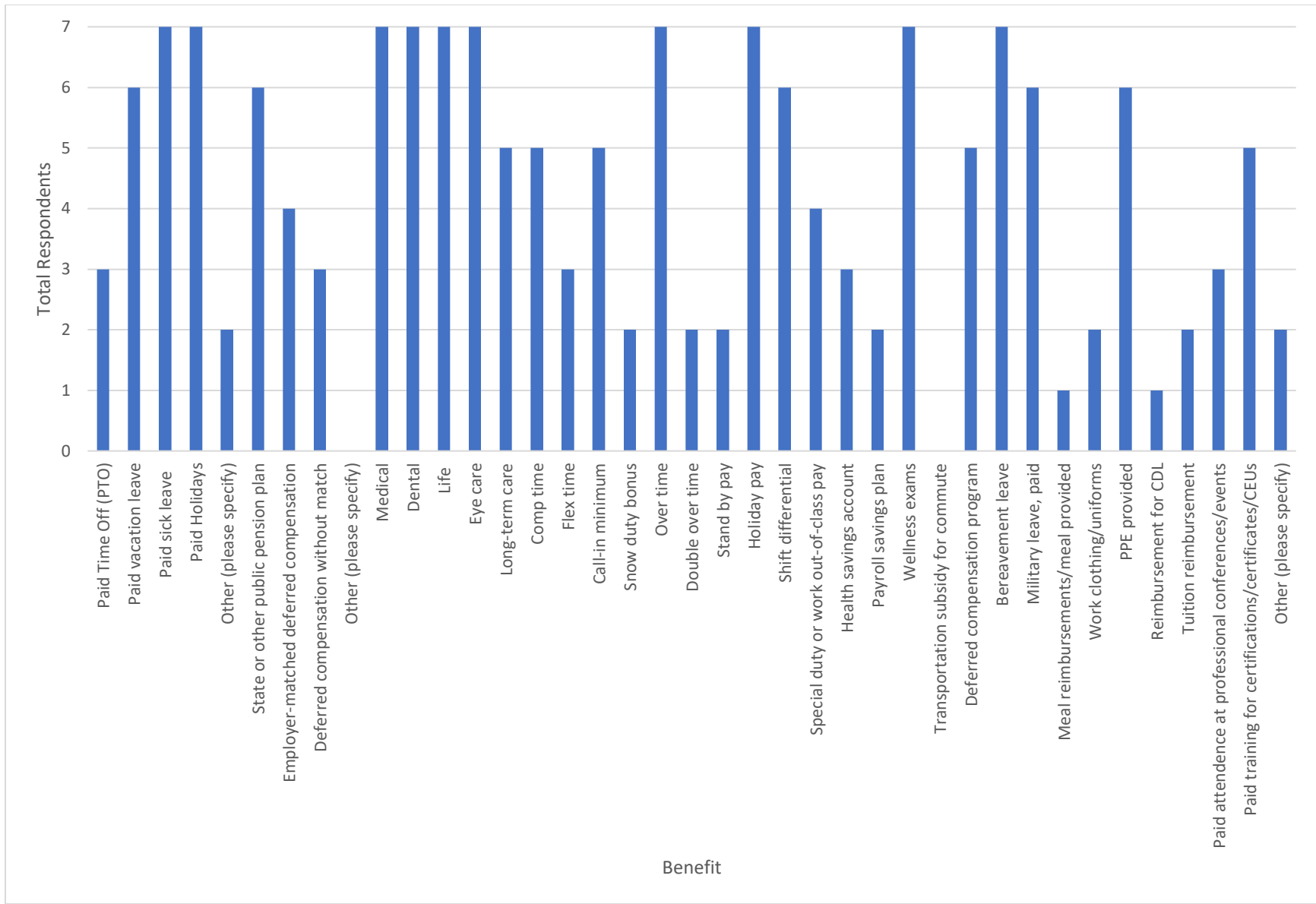


Figure 2. Employee Benefits Offered

Respondents were asked a follow-up question about which employees received benefits (Figure 3). All respondents offered benefits to their full-time, permanent staff and just over half (57.1%) offered benefits to their seasonal hires (Table 13). Only one respondent (Minnesota DOT) was offering benefits to their full-time and part-time staff (over 20 hours) as well as their seasonal hires.

Table 13. Employees Receiving Benefits

Benefits Available To:	Total Respondents	Percentage of Total Respondents (N=7)
Only full-time permanent staff	7	100.0%
Part-time (working at least 30 hours per week)	2	28.6%
Part-time working at least 20 hours per week	1	14.3%
Seasonal hires	4	57.1%

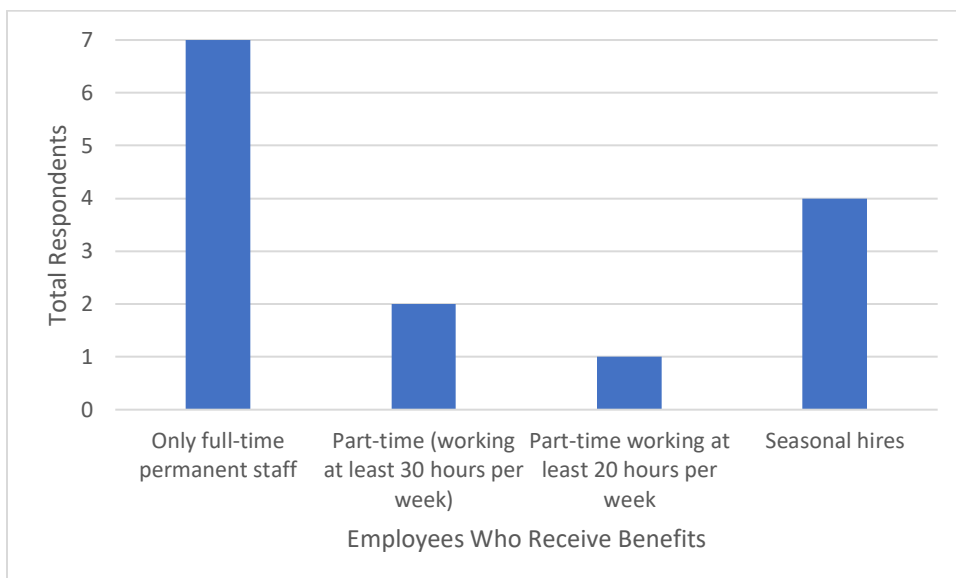


Figure 3. Employees Receiving Benefits

Recruitment of Employees

Recruitment Strategies

Respondents were asked which methods they used to post job opportunities; seven respondents answered this question (Figure 4, Table 14). All respondents were using social media, employment websites like LinkedIn or Indeed, state websites, and job fairs. Agency websites and word of mouth were also common methods to get the word out about job opportunities. None of the respondents were using headhunters to recruit highway maintenance workers to their agency.

Table 14. Job Posting Method Utilized

Job Posting Method	Total Respondents	Percentage of Total Respondents (N=7)
Social Media	7	100.0%
Newspaper	2	28.6%
Employment Websites (Indeed, LinkedIn, etc.)	7	100.0%
Agency Website	6	85.7%
State Website	7	100.0%
Job Fairs	7	100.0%
Word of Mouth	6	85.7%
Headhunters	0	0.0%
Workforce Service Agencies	4	57.1%
Unions	3	42.9%
Other	0	0.0%

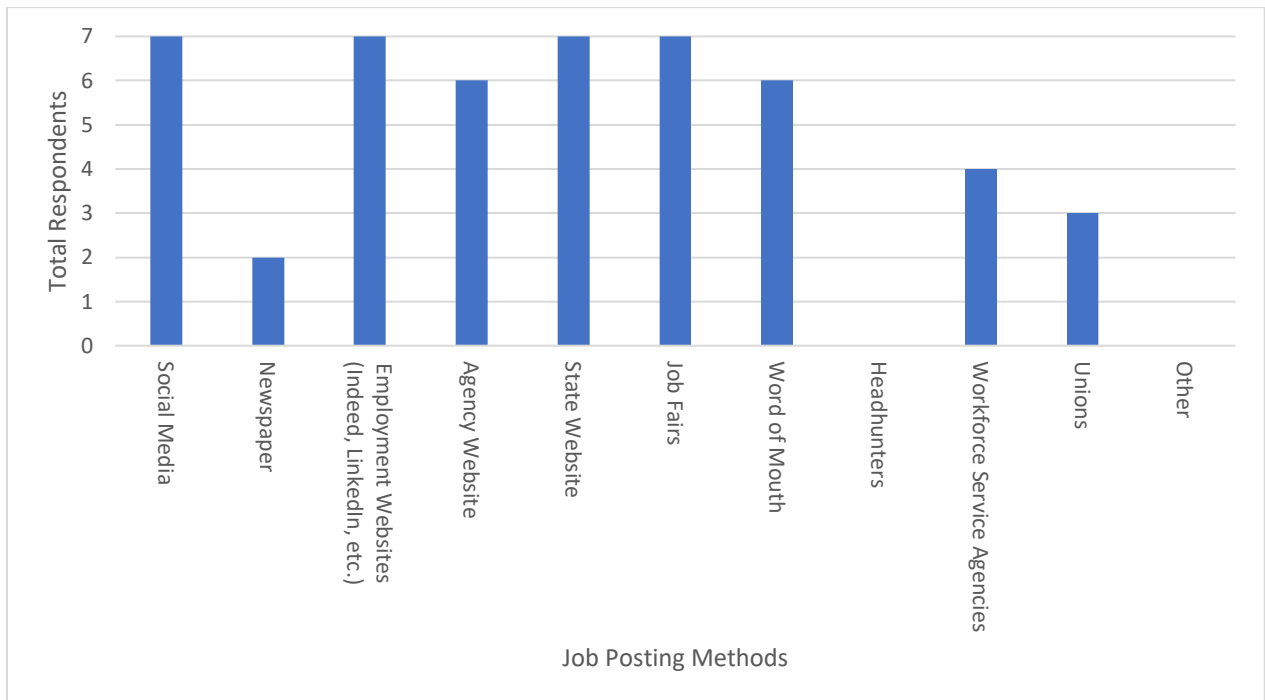


Figure 4. Job Posting Methods

Respondents were then asked to check the following recruitment strategies their agency used including recruitment bonuses, marketing of employee benefits programs, marketing of on-the-job education, training, up-skilling opportunities, marketing of career ladder/career advancement opportunities, positive messaging regarding work and/or work-place culture, or other. Seven respondents provided information on their recruitment strategies. All respondents indicated they market employee benefits

programs and most (85.7%) marketed career ladder or advancement opportunities and used positive messaging about the work and/or work-place culture (Figure 5, Table 15). None of the respondents utilized recruitment bonuses. One respondent replied other and noted that they were used marketing work/life balance.

Table 15. Recruitment Strategy Utilized

Recruitment Strategy	Total Respondents	Percentage of Total Respondents (N=7)
Recruitment Bonuses	0	0.0%
Marketing of employee benefit programs	7	100.0%
Marketing of on-the-job education/training/up-skilling opportunities	4	57.1%
Marketing of career ladder/career advancement opportunities	6	85.7%
Positive messaging regarding work and/or work-place culture	6	85.7%
Other	1	14.3%

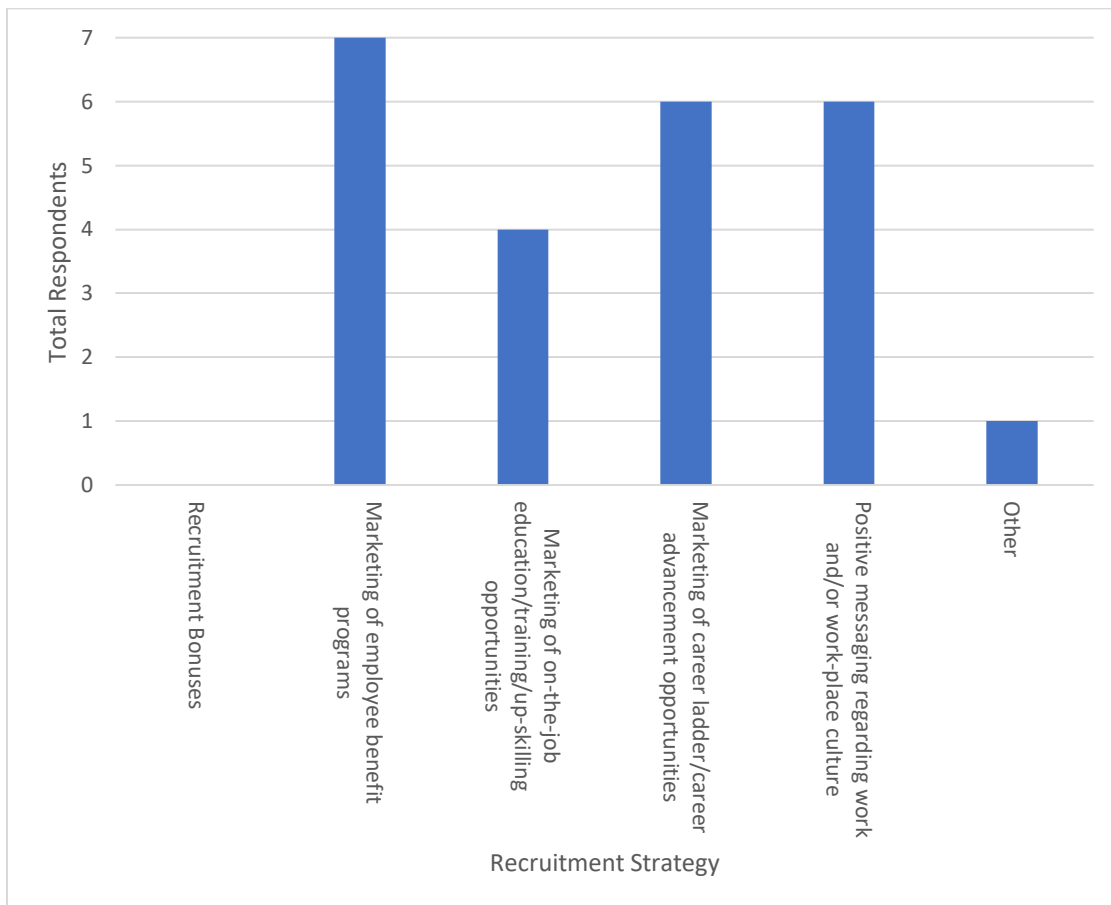


Figure 5. Recruitment Strategies Utilized

A follow-up question asked respondents which recruitment strategies they found to be successful and why (Table 16). Two respondents mentioned that word of mouth was their most successful strategy to recruit new employees. One respondent felt that it was a combination of all of the mentioned strategies that helped them successfully recruit new employees. One felt that since they did not track that type of information that it was hard to determine which recruitment strategies were most successful.

Table 16. Successful Recruitment Strategies

Agency	Which recruitment strategies have been successful and why?
MI Dept of Transportation	Unclear as new employees are not asked how they came to know about MDOT and why they applied - Information is not tracked
MnDOT	Word of mouth has been a great way to get employees.
NH DOT	Word of mouth is our most successful strategy
North Dakota Department of Transportation Human Resources	Marketing employee benefits, marketing career ladder/career advancement opportunities, positive messaging regarding workplace culture
PA Department of Transportation (PennDOT)	The combination of all of the above result in an acceptable successful overall strategy.

Respondents were asked if they specifically target any demographic groups in their recruitment activities, seven respondents replied (Figure 6, Table 17). Most respondents (85.7%) targeted high school graduates, military veterans, women, minorities, and underserved populations in their recruitment strategies.

Table 17. Demographic Groups that were Targeted for Recruitment

Demographic Group Targeted	Total Respondents	Percentage of Total Respondents (N=7)
High school graduates	6	85.7%
College or technical school attendees / apprenticeship program participants	5	71.4%
Second career (persons wanting to change careers)	5	71.4%
Military veterans	6	85.7%
Retirees	4	57.1%
Women	6	85.7%
Minorities	6	85.7%
Underserved populations (inner-city areas	6	85.7%
Current inmates that are about ready to be released	4	57.1%
Other	0	0.0%

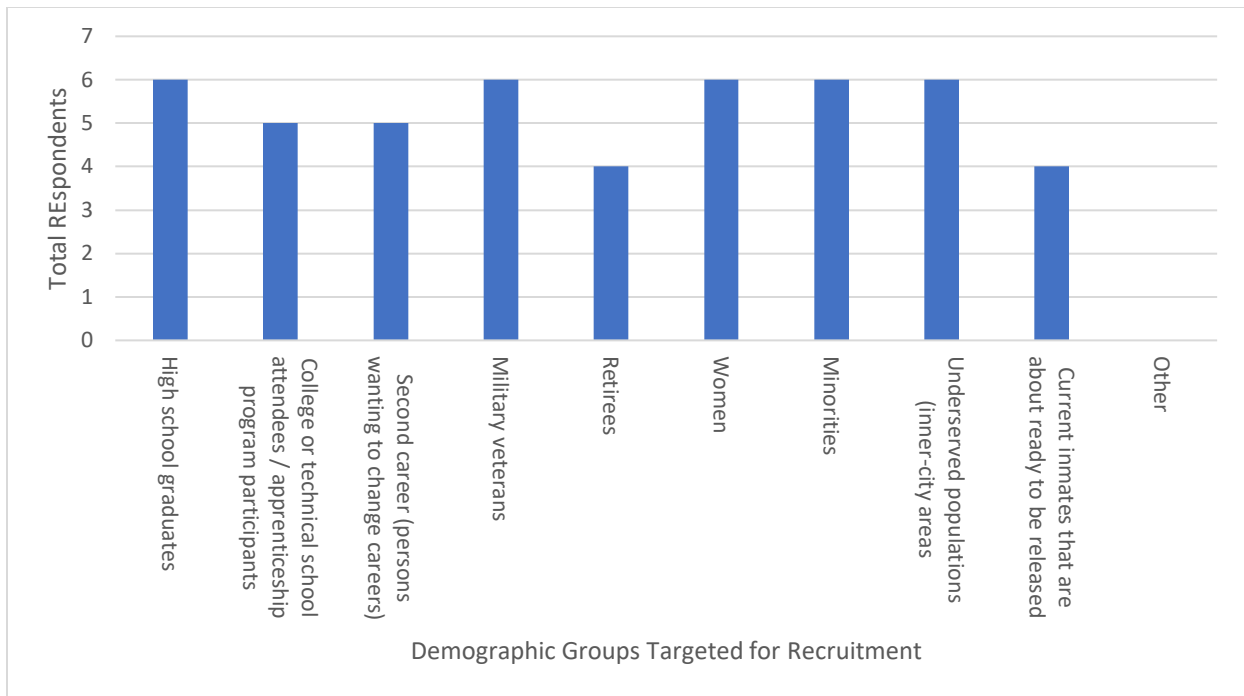


Figure 6. Demographic Groups that were Targeted for Recruitment

A follow-up question asked respondents to describe the strategies and methods that were used to target specific demographic groups (Table 18). North Dakota DOT has implemented a number of programs to encourage younger children, high school, and college age students to consider DOT careers. These efforts include a Be Smart program which goes to elementary and high schools to discuss potential careers at the DOT and defensive driving. North Dakota DOT hosts “touch a truck” events to get kids excited about snowplows and engages students during local college and career fairs. Minnesota DOT mentioned that they have specific programs that go into underserved communities. New Hampshire DOT mentioned working with the Department of Corrections to recruit inmates that were pending release, this program has had about a 50% success rate. North Dakota DOT mentioned similarly working with the Department of Corrections but having less success with this program.

Table 18. Detailed Recruitment Strategies

Agency	Please describe strategies and methods targeting any or all of the above and indicate whether they have been successful or unsuccessful.
MI Dept of Transportation	Unclear as new employees are not asked how they came to know about MDOT and why they applied - Information is not tracked
MnDOT	Distinct programs to go into underserved communities.
NH DOT	Working with DOC inmates pending release has proven to be 50% successful in retention. Underserved, minority, women has not proven to be successful
North Dakota Department of Transportation Human Resources	We created a program, called Be Smart, where we go into elementary and high schools to talk about defensive driving and careers with NDDOT. This is successful because we are putting the idea of working for us in their head when they are young. We also take part in community touch a truck events where we see a lot of kids excited to sit in a snowplow. We have held our own community fairs to have the public come sit in a snowplow. We take a snowplow to the ND State Fair for 10 days.

	The events where we have the equipment there for the public to see have all been very successful. Recruiting at college and high school career fairs goes over well for other positions but not as well for the highway maintenance workers. We have started working with the prison to talk with current inmates that are ready to be released. We have not seen success with this yet but hope to in the future.
PA Department of Transportation (PennDOT)	The inclusion of all recruitment outreach programs has been reasonably successful.

Respondents were asked to explain how they have changed their recruitment efforts in the last 5 years and why, six respondents provided details on changes to their recruitment efforts (Table 19). A focus on targeting recruitment to students was common as well as embracing technology changes and social media to reach a wider audience.

Table 19. Recruitment Strategy Changes

Agency	Please explain how you have changed your recruitment efforts in the last 5 years and why.
MI Dept of Transportation	The only change was adding soon to be released prisoner recruitment as the Department of Corrections added a CDL training program to their rehabilitation success programs.
MnDOT	<ul style="list-style-type: none"> • More electronic job sites and postings; • More targeted recruitment; • Follow up with individual candidates; keep in touch and tracking;
NH DOT	Focus more on tech school, high school, job fairs. Unemployment was 2.5 % in NH last winter
NHDOT	Focus more on total compensation packages (benefits and wages) and work/life balance
North Dakota Department of Transportation Human Resources	I began my employment as the Recruitment Manager with NDDOT 3 years ago. Prior to me coming to NDDOT there was much less recruitment efforts. I am involved with our Communications Division for posting on social media accounts. I attend an average of 60 career events a year. I have created community events specific to NDDOT careers and State of North Dakota careers. I work with the local news and radio stations to put out information about our careers. I have presented at our Leadership Development Journey programs to talk to our own staff about how important it is to promote where you work if you love your job. I have trained other employees on how to be a successful recruiter. Being involved in the public often will make them think of you when they are looking for a career.
PA Department of Transportation (PennDOT)	Evolved to incorporate and embrace changes in technology and social media to reach a larger and targeted audience more effectively.

Employee Retention

Difficulty with Retaining Highway Maintenance Workers

Respondents were asked to rank the level of difficulty their agency had in retaining highway maintenance workers on a scale from 1 (none) to 5 significant. Seven respondents ranked their difficulty which ranged from 2 to 4 with an average of 2.7.

Exit Interviews

Exit interviews can provide meaningful feedback on why an agency may be struggling to retain employees. Respondents were asked whether their agency conducted exit interviews and if so, which questions from their exit interview that they found to be most helpful or insightful and least helpful or insightful. Six respondents answered this question, all six were conducting exit interviews. Only four respondents provided feedback on their exit interview questions (Table 20). Three respondents found that the question “Why are you leaving your position?” was the most helpful question on their exit interview, but one respondent found this question to be least helpful. This respondent found questions related to supervision, new employee orientation, and safety to be most helpful.

Table 20. Exit Interview Questions

Agency	Does your agency conduct exit interviews?	Which questions from your exit interview have you found to be most helpful/insightful and least helpful/insightful?
MI Dept of Transportation	Yes	Why are you leaving?
MnDOT	Yes	Most helpful - supervision, new employee orientation, safety Least helpful - reasons why actually leaving
NH DOT	Yes	Most telling: Why are you leaving---it's not just about wages
North Dakota Department of Transportation Human Resources	Yes	Most helpful has been why are you leaving your position? The least helpful has been what could we have done differently?
PA Department of Transportation (PennDOT)	Yes	
PA Department of Transportation (PennDOT)	Yes	

Reasons for Leaving Position

Respondents were asked to provide reasons that their employees were leaving their agency besides retirement, six respondents answered this question. All respondents were losing employees due to career changes outside of the organization (Figure 7, Table 21). Most respondents (83.3%) were losing employees due to a job change within the organization, competition from the private sector for similar jobs, competition from the county, city, or other public sector agencies for similar jobs, and because of compensation/benefits. It was less common for respondents to lose employees due to relocation, lack of professional development or training opportunities, lack of opportunities for promotion or career advancement, and due to failing a USDOT CDL physical.

Table 21. Reasons for Losing Employees

Reason for Employees Leaving	Total Respondents	Percentage of Total Respondents (N=6)
Career change (outside of organization)	6	100.0%
Job change (within organization)	5	83.3%
Competition from private sector for similar jobs/work	5	83.3%
Competition from county, city, or other public sector agencies for similar jobs/work	5	83.3%
Relocation	1	16.7%
Health or family issues	3	50.0%
Permanent disability	3	50.0%
Dissatisfaction/job stress	2	33.3%
Workplace culture/leadership issues	2	33.3%
Lack of professional development/training	1	16.7%
Lack of opportunities for promotion/career progression/advancement	1	16.7%
Compensation/benefits	5	83.3%
Substance abuse training	2	33.3%
US DOT/CDL physical failure	1	16.7%
Loss of CDL due to traffic violations	2	33.3%
Termination due to performance or behavioral issues	2	33.3%
Other	0	0.0%

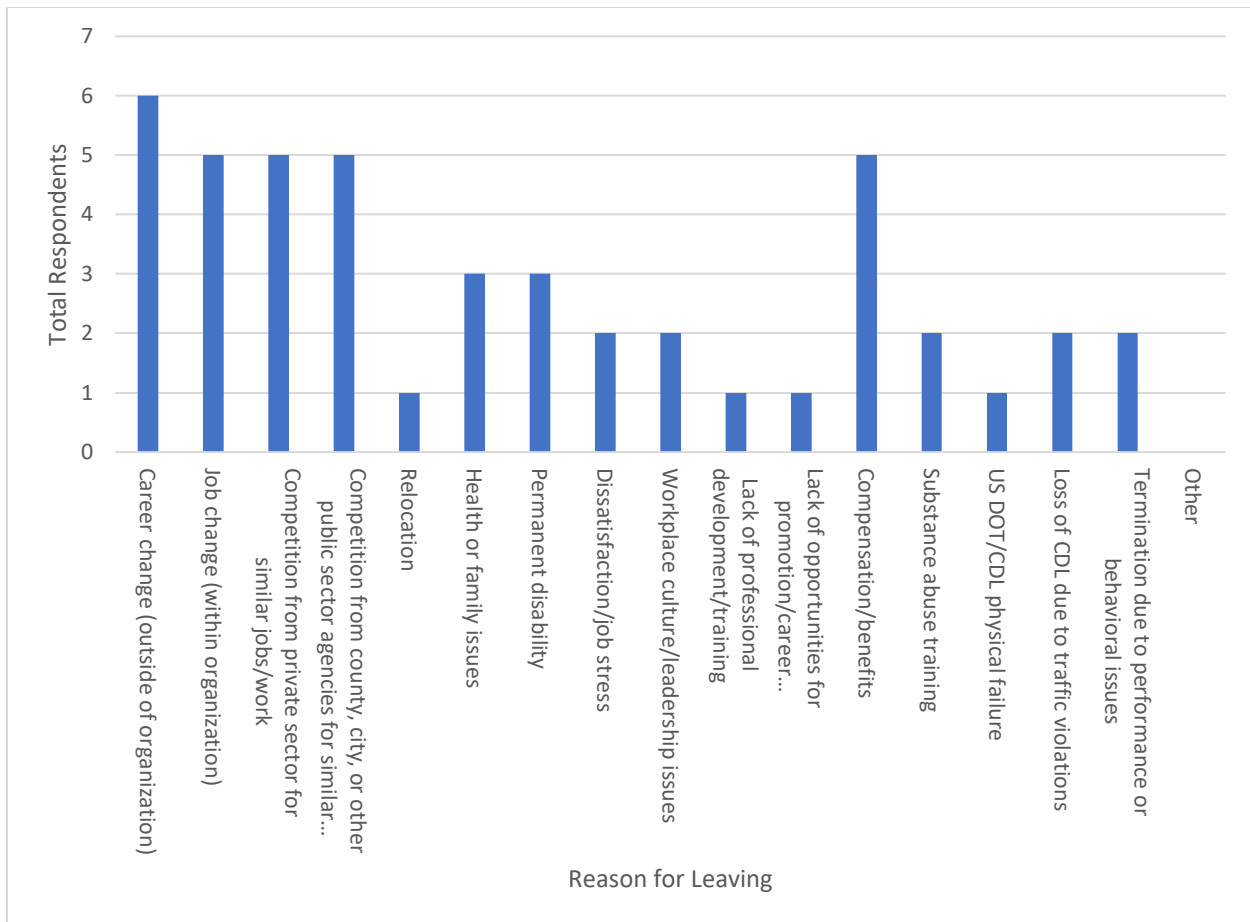


Figure 7. Reasons for Losing Employees

Retention Strategies

Respondents were asked which retention strategies were utilized at their agency, with seven respondents providing responses. All respondents were using employee recognition and/or service year awards and promotions, succession planning, and/or career ladders (Figure 8, Table 22). Cross training and job enhancement were also commonly used retention strategies. Retention bonuses and attendance at region/national conferences were less common. One respondent noted that they used an “other” retention strategy, this was longevity bonuses.

Table 22. Retention Strategies

Retention Strategies	Total Respondents	Percentage of Total Respondents (N=7)
Employee recognition and/or service year awards	7	100.0%
Merit-based pay raises	2	28.6%
Retention bonuses	1	14.3%
Education/tuition reimbursement (for GED, AA, BA/BS)	3	42.9%

Certificate/Certification courses offered by recognized organizations (LTAPs, APWA, IMSA)	4	57.1%
Cross-training/job enhancement	6	85.7%
Attendance at regional/national conferences (APWA, IMSA)	2	28.6%
Mentor/Mentee programs	4	57.1%
Promotions/succession planning/career ladders	7	100.0%
Other	1	14.3%

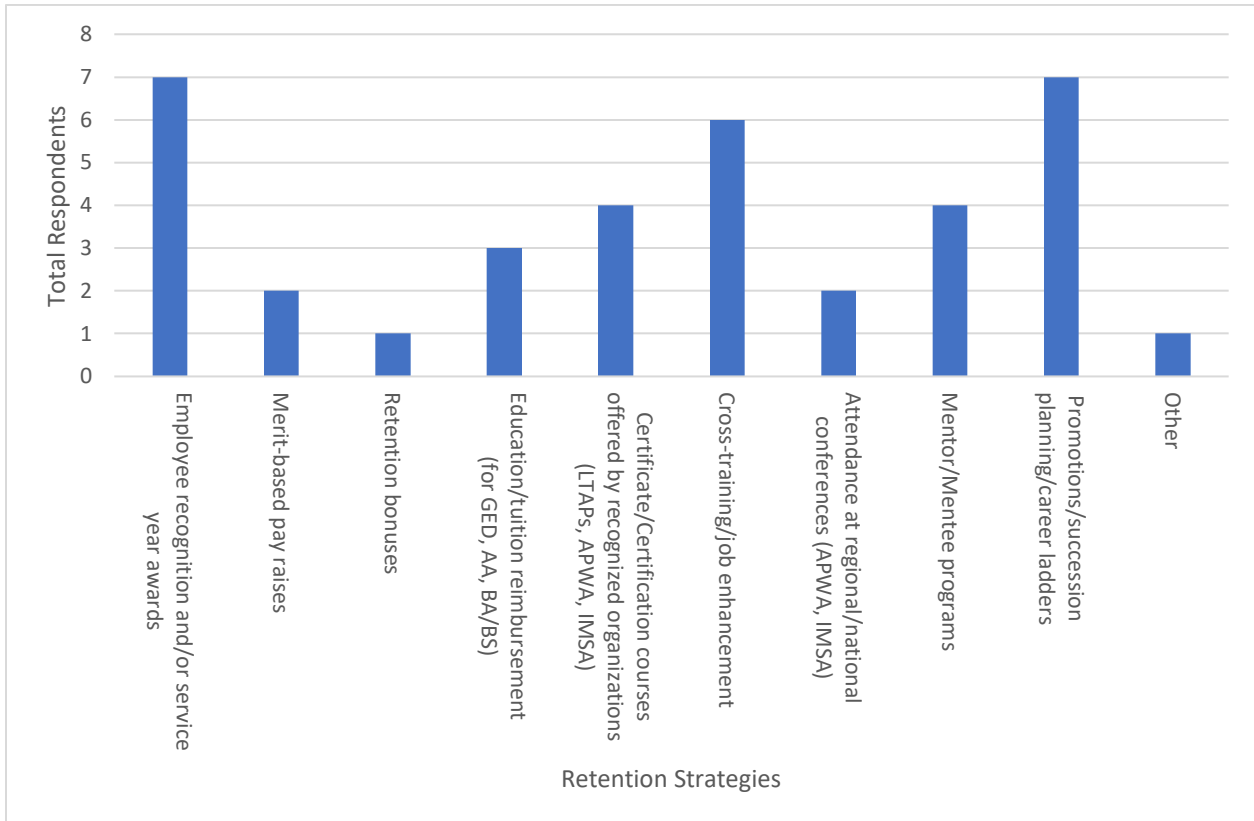


Figure 8. Retention Strategies

Respondents were asked if their agency had difficulty retaining the following demographic groups: age 30 and younger, between the ages of 31 and 49, age 50 and older, women (all age groups), minorities, or other demographic group. Seven respondents answered this question. None of the respondents stated having issues retaining employees age 50 and older (Figure 9, Table 23). There was a mix of responses, 42.9% of respondents struggled with retaining the following demographic groups: age 30 and younger and women of all age groups. Additionally, 3 respondents (42.9%) stated that they did not experience difficulty retaining any demographic groups.

Table 23. Difficulty Retaining Specific Demographic Groups

Demographic Groups Agencies Struggle to Retain	Total Respondents	Percentage of Total Respondents (N=7)
None	3	42.9%
Age 30 and younger	3	42.9%
Between the ages of 31 and 49	2	28.6%
Age 50 and older	0	0.0%
Women (all age groups)	3	42.9%
Minorities	2	28.6%
Other	0	0.0%

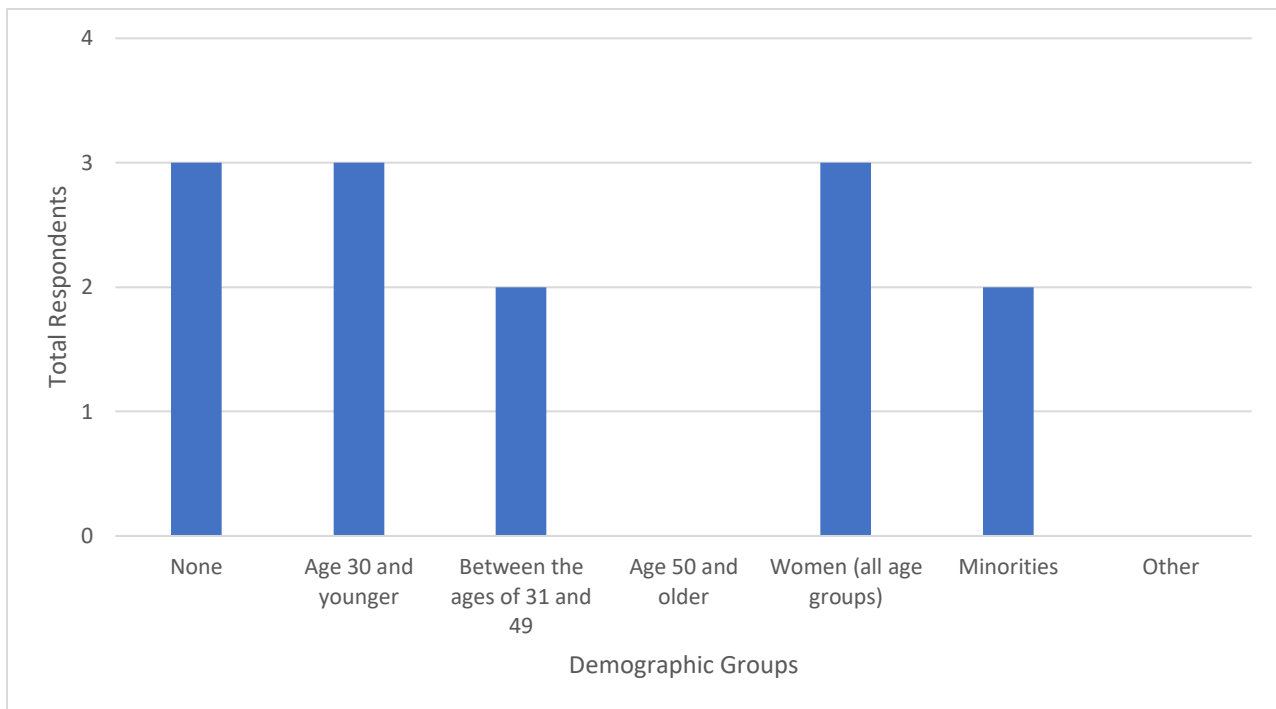


Figure 9. Difficulty Retaining Specific Demographic Groups

Successful Retention Strategies

Respondents were asked to describe the most effective, successful retention strategies used in their agency. Six respondents provided information on their successful strategies (Table 24). Successful strategies mentioned included creating a positive workplace culture, promoting work/life balance and flexibility, employee benefits programs, employee training programs, and promotion and leadership programs.

Table 24. Successful Retention Strategies

Agency	What are the most effective/successful retention strategies used in your agency?
MI Dept of Transportation	Benefits - Paid Leave and Health Care
MnDOT	Cross-training and career advancement tracks
NH DOT	Professional promotion series---time and good performance equal promotion (limited)
NHDOT	employee referrals, promoting work/life balance, supporting the community you live in
North Dakota Department of Transportation Human Resources	Positive workplace culture, flexibility, family benefits, career advancement opportunities, and the leadership development journey program.
PA Department of Transportation (PennDOT)	All noted retention strategies above have had reasonable levels of success.

Employee Retention Metrics

Respondents were asked which of the following employee retention metrics their agency utilized: turnover, tenure, cost of turnover, first-year resignation and termination rate, and other. Seven respondents answered this question (Figure 10, Table 25). Most respondents (85.7%) tracked employee turnover. None tracked the cost of employee turnover. Two respondents mentioned utilizing other employee retention metrics, these included age, reason for separation, and length of service.

Table 25. Employee Retention Metrics Used

Retention Metric	Total Respondents	Percentage of Total Respondents (N=7)
Turnover	6	85.7%
Tenure	3	42.9%
Cost of turnover	0	0.0%
First-year resignation and termination rate	3	42.9%
Other	2	28.6%

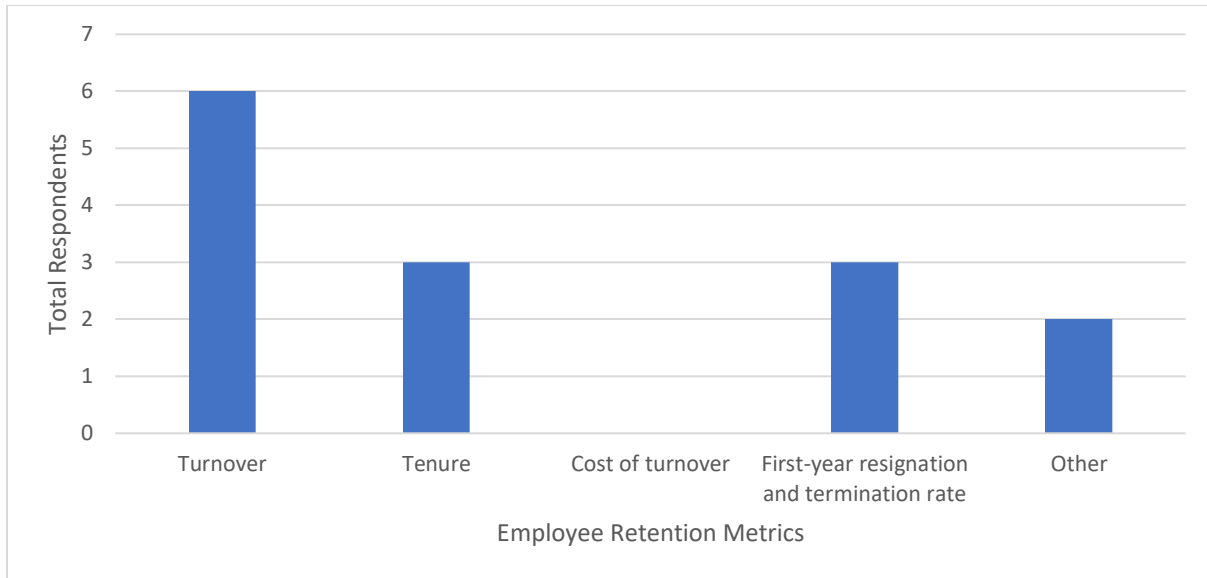


Figure 10. Employee Retention Metrics

Recent Changes to Retention Efforts

Respondents were asked to provide information on any changes that have been made to their retention efforts within the last five years (Table 26). One respondent mentioned developing a Leadership Development Journey program that helps employees use their talents and skills and opportunities to learn new talents and skills. Another respondent mentioned they have evolved to incorporate changes in technology and social media to reach a larger audience. Additional changes included offering flexible scheduling and focusing on work/life balance.

Table 26. Recent Changes to Retention Efforts

Agency	Please explain how you have changed your retention efforts in the last 5 years and why.
MI Dept of Transportation	We have not changed any retention efforts as we are a state organization
MnDOT	Employee Resource Groups; phased retirement
NH DOT	Focus on work/life balance
NHDOT	extremely low unemployment rate in NH
North Dakota Department of Transportation Human Resources	We have developed a Leadership Development Journey program to help employees utilize talents not required by their job and to learn new talents. We are also offering flexible scheduling.
PA Department of Transportation (PennDOT)	Evolved to incorporate and embrace changes in technology and social media to reach a larger and targeted audience more effectively.

Road Blocks

Respondents provided information on any road blocks that they have faced in trying to change their employee retention plans (Table 27). Three respondents reported road blocks with unions and bargaining agreements. Three respondents mentioned facing challenges with pay increases and benefits

programs as these were controlled by the state government. Additional road blocks included civil service requirements and struggles with managers being unwilling to change strategies.

Table 27. Road Blocks to Retention Plan Changes

Agency	What are your road blocks to changing your retention plan?
MI Dept of Transportation	Unions, Civil Service Requirements
MnDOT	Bargaining Agreements
NH DOT	Union environment, Wages determined at State level
NHDOT	Inability for wage control at agency level, some managers unwilling to change strategies or recognize a culture/behavior issue in certain areas
North Dakota Department of Transportation Human Resources	Pay increases and benefits are controlled by North Dakota State government, not by the agencies.
PA Department of Transportation (PennDOT)	None.

Additional Recruitment and Retention Efforts

Respondents were asked to provide any additional information related to recruitment and retention of employees that had not previously been mentioned. One respondent from North Dakota DOT mentioned that they provided tours of their buildings to anyone interested.

COVID-19

Due to the COVID-19 pandemic agencies have faced challenges with the various measures required to keep employee’s safe and healthy, and have faced challenges recruiting employees due to a hiring freeze, layoffs, or reduction in hours. Respondents were asked to describe how their agency or department has addressed COVID-19 related issues (Table 28). All respondents mentioned efforts to keep employees socially distanced including altering shift schedules or alternating shifts as well as policies requiring the use of masks and increasing cleaning and sanitation protocols. A few respondents mentioned that they were temperature checking employees and one respondent noted that symptomatic employees are sent home immediately and if they test positive for COVID-19 or have been in close contact with someone who has tested positive they must quarantine for 14 days. Two respondents provided their agency’s full policies related to COVID-19, these are provided in Appendix C.

Table 28. COVID-19 Related Policies

Agency	Please describe how your agency/department has worked to address COVID-related issues. If possible, please provide any policy related to COVID measures including testing, masks, disinfecting, alternating shifts, etc. Policy can be emailed to Karalyn Clouser at karalyn.clouser@montana.edu .
MI DOT	Social distancing for Maintenance Workers, masks, shift schedules altered
MnDOT	Emailed Policies – see Appendix C
NHDOT	Emailed Policies – see Appendix C
ND DOT Human Resources	We are following the State of North Dakota Department of Health guidelines. If one of our employees has symptoms, they are sent home immediately. Staff that are still working in the offices must be temperature checked when they arrive at work. We have sent a majority of our office staff workforce to work from home. We have hired more cleaners to come through to sanitize more frequently. Any of our employees that test positive, have been in close contact with someone who has tested positive, has tested due to having symptoms, or has been told they need to quarantine by the Department of Health will quarantine for 14 days, unless they receive negative tests.
PA DOT (PennDOT)	Our agency has employed multiple strategies to maintain employee and customer safety in response to the COVID-19 pandemic, to include testing, masks, strict cleaning and disinfecting protocols, alternating shifts, and social distancing measures, in order to remain compliant to Federal/State regulations, and Directives from the PA Governor’s Office and PA Department of Health.

Respondents were then asked if their agency was currently in a hiring freeze or undergoing layoffs, furloughs, reduction in hours, or pay cuts. Seven respondents answered this question (Figure 11). Just over half (57.1%) said yes that they were currently in a hiring freeze or undergoing layoffs, furloughs, reduction in hours, or pay cuts.

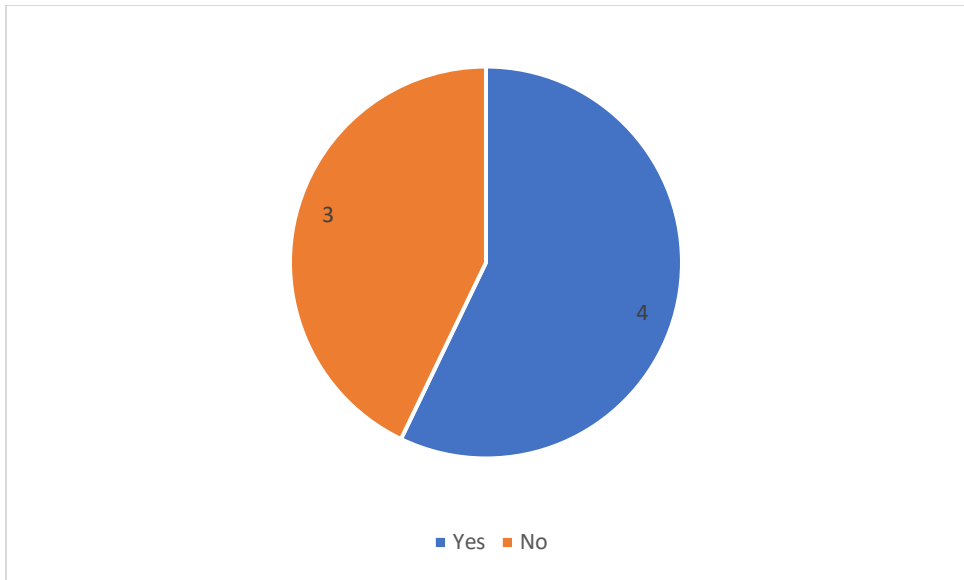


Figure 11. Are you currently in a hiring freeze or undergoing layoffs, furloughs, reduction in hours, or pay cuts?

Winter Maintenance Manager Survey

This survey had a total of 101 responses from 28 states across the US.

Respondent Information

Respondents were asked to provide information on their job title and agency (Table 29). Respondents covered state, county, and local agencies.

Table 29. Job Title and Agency

Job Title	Agency
Transportation Maintenance Manager	
Fairbanks District Superintendent	Alaska DOT&PF Northern Region Highways & Aviation
Area maintenance supervisor	AOT
supervisor	AOT
Supervisor	AOT District 5
Maintenance Region Manager	California Dept. of Transportation
Maintenance Manager II	CalTrans District 09
Superintendent	City of Bozeman Streets
Deputy City Manager	City of Charlottesville, VA
Streets Superintendent	City of Crystal
Asst. to the Public Works Director	City of Crystal Lake
Director of Public Works	City of Fairway, KS Public Works Dept
Road Maintenance Supervisor	City of Farmington Hills, MI-DPW
Director of Public Works	City of Fishers, IN
Public Works Director / City Engineer	City of Fridley Public Works Department
Public Service Director	City of Groveport

Public Works Director	City of Kirtland
street super	City of Littleton Public Works Streets Division
Street & Fleet Superintendent	City of Oakdale Public Works
Manager	City of Richmond
Street Maintenance Manager	City of St. Paul
Engineering Manager	Denver Department of Transportation and Infrastructure/Street Maintenance/Asset Management
Maintenance Manager	Department of Transportation
Maintenance Staff tech	District 1
TMAS	DISTRICT 1
RME	District 4 Hereford
HWYADM@	DOH
Trcrsv 2	Highways DoH d413
Maintenance Manager	Highway 7300 D-8 R-3
Transportation Maintenance Manager	Highway/Maintenance/ District 4
Foreman	Idaho Trans Dept
tech. operations team leader	Idaho Trans dept
Highway Section Foreman	Idaho Trans. Dept. District 2
Foreman	Idaho Transportation Department
Operations Manager	Idaho Transportation Department District 3
TOTL	ITD
TTP	ITD
TOTL	ITD D5
Mtce. Foreman	ITD/district 4/Shoshone/Fairfield
Bureau Chief of Maintenance	Kansas DOT
Highway Maintenance Engineer	MaineDOT
Superintendent of Operations	MaineDOT
Crew Supervisor	MaineDOTRegin4
area supervisor	Mass DOT D3B
FMS1	MDOT/SHA
Superintendent of Operations	MEDOT Region 5
State Maintenance Engineer	Minnesota Department of Transportation
Highway Maintenance Superintendent	MnDot/District 7
Maintenance Coordinator	NDDOT/Dickinson
Asst. District Engineer	Nevada DOT/District II
Street Maintenance Assistance Administrator	Newport News Public Works
State Maintenance Engineer	NHDOT-Highway Maintenance
TMM (Temp)	ODOT
Transportation Maintenance Manager	ODOT
Transportation Maintenance Manager	ODOT Delivery and Operations D12
PEMC	ODOT Hwy Maintenance district 1

TMM	ODOT Maintenance 1 2C
TMM	ODOT region 1 2B
TMM	ODOT Region 2
TMM	ODOT Region 3, District 7, Highway
TMM	ODOT Region 4 Dist.11
TMM	ODOT, D-12
Maintenance Manager	ODOT, Highway, D8
TMM	ODOT/Hwy/12
coordinator	Oregon Department of Trans.
Transportation Maintenance Manager	Oregon Department of Transportation; Highway/Maintenance/2C
Transportation Maintenance Manager	Oregon Dept. of Transportation/Highway/High Cascade Area
Manager	Oregon Dept. of Transportation
Maintenance manager	Oregon DOT
Director Public Works-Township Engineer	Patton Township, Centre County, PA
Winter Services Manager	PennDOT
Maintenance and Operations Division Manager	Pierce County Planning and Public Works, Maintenance and Operations Division
Public Works Director	Public Works Germantown, TN
Director of Highway Maintenance	Road Commission for Oakland County
RME	SHA
Public Works Director	Syracuse City Utah
Director of Public Works	Town of Waterford, CT
Superintendent	Transportation
Equipment superintendent	Transportation/Highways/District 5
Manager	Unified Government/Street Division
District Administrator	Vermont Agency of Transportation
General Manager, Operations	Vermont Agency of Transportation
Public Works Director	Village of Algonquin, IL DPW
Street Supervisor	Village of Bartlett / Streets
Asst. Superintendent	Village Of New Lenox - Streets
Supervisor	VTrans
General Manager	VTrans/Highway/Maintenance/District 4
Superintendent	WSDOT
Highway Administrator 2	WV DOH
County Highway Administrator	WVDOT
Maintenance Engineer	WVDOT Division of Highways
District Maintenance Engineer	WYDOT
Area Maintenance Supervisor	WYDOT Dist 3 Southwest AMS
District Maint. Eng.	WYDOT/D1

Agency Information

Respondents were asked to provide information on their winter maintenance staff and vacancies at the beginning of the 2019-2020 winter season for each of the following job types; full-time; part-time, year-round; seasonal, temporary workers; contractors (using own vehicles/equipment); and auxiliary/supplemental workers from other divisions. A total of 96 respondents provided information on their employees and vacancies.

Total Employees

Full-time employees made up the bulk of the winter maintenance staff with an average of 99 employees (Figure 12). Part-time, year-round employees made up the smallest portion of winter maintenance staff with an average of just 3 employees.

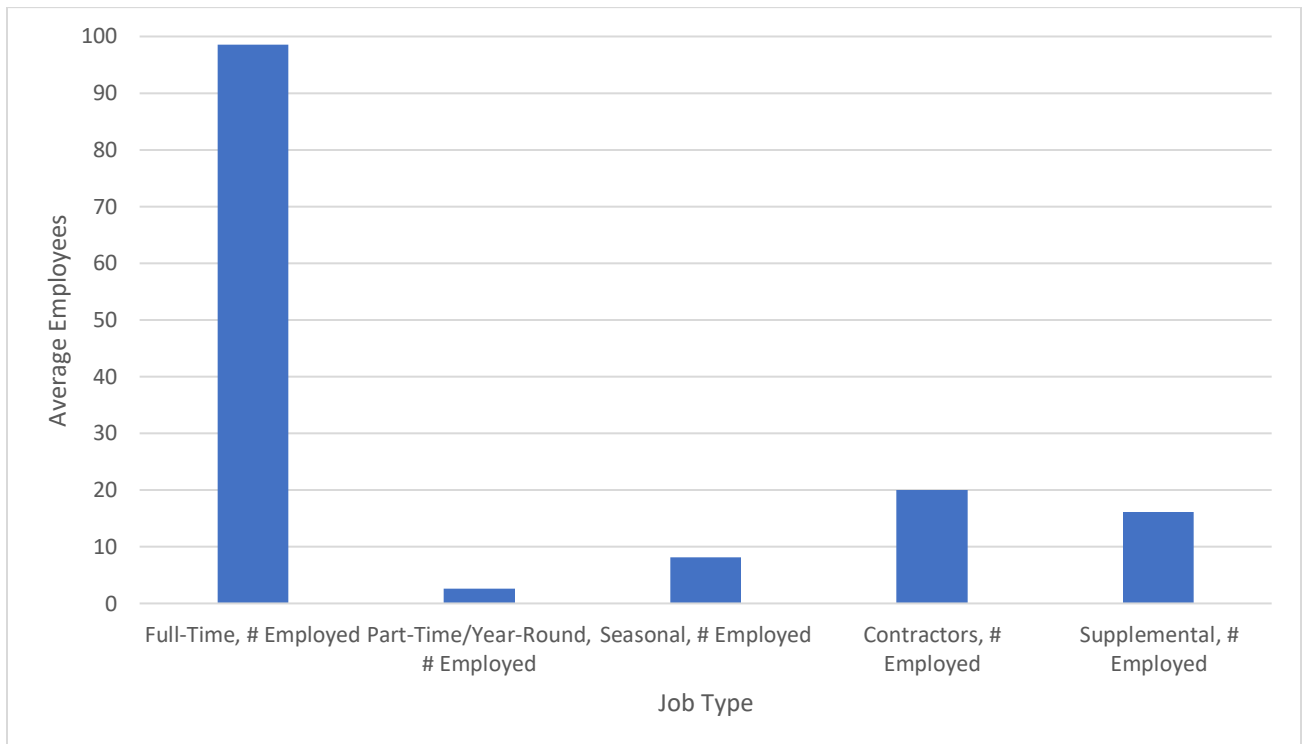


Figure 12. Average Employees by Job Type

Vacancies

Vacancies tended to be low (less than 20). Agencies tended to have the most vacancies for contractors with an average of 20 vacancies (Figure 13), followed by full-time positions which had an average of 14 vacancies. Respondents on average had zero vacancies for part-time, year-round employment.

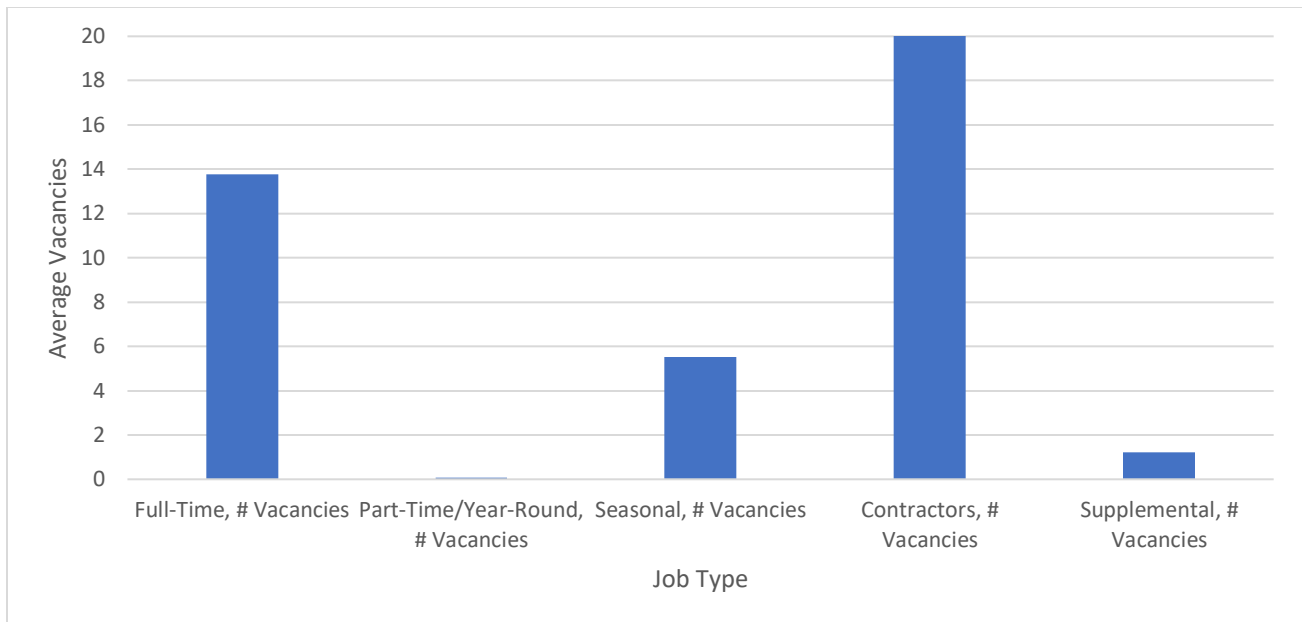


Figure 13. Average Vacancies by Job Type

Respondents were asked for the approximate length of time (in calendar days) to fill vacancies from initial requisition to offer or employment, 90 respondents provided information on the length of time (Table 30). Vacancy duration ranged from just one week to 2 years. The average vacancy duration was 73 days. One respondent specifically mentioned that for their agency, vacancies for temporary workers are longer (a few months) when compared to vacancies for full-time positions (one month).

Table 30. Approximate Length of Time (in calendar days) to Fill Vacancies

Agency	Vacancy Duration
	21
	48
	90 days
	120 days
	180
	It can take 6 months to one year
	N/A. Wisconsin has 72 counties in which each county plows the state roads in their counties. They control all the hiring/recruitment process
Alaska DOT&PF Northern Region Highways & Aviation	120 days
AOT	60/75
AOT	90 days
California Dept. of Transportation	120
CalTrans District 09	120
City of Bozeman Streets	one month
City of Charlottesville, VA	60

City of Crystal	1-2 weeks
City of Crystal Lake	30 days
City of Fairway, KS Public Works Dept	60-90 days
City of Farmington Hills, MI-DPW	60
City of Fishers, IN	35 days
City of Fridley Public Works Department	45
City of Kirtland	90
City of Oakdale Public Works	60
City of Richmond	2 years
City of St. Paul	60
Denver Department of Transportation and Infrastructure/Street Maintenance/Asset Management	60
Department of Transportation	30 days for new hires
District 1	30-60 days
DISTRICT 1	2-3 months
District 4 Hereford	30
DOH	3 months
Highway 7300 D-8 R-3	30
Highway/Maintenance/ District 4	60 days
Idaho Trans Dept	40 to 50
Idaho trans dept	45 days
Idaho Trans. Dept. District 2	approx. 40 days
Idaho Transportation Department	45
Idaho Transportation Department District 3	60 days
ITD	30
ITD	30-100 days
ITD D5	60 days
ITD/district 4/Shoshone/Fairfield	30 days
Kansas DOT	30 days
MaineDOT	Roughly 30 days
MaineDOT	2 months
MaineDOTRegin4	30
MEDOT Region 5	60
Minnesota Department of Transportation	3-6 weeks
MnDot/District 7	45 days
NDDOT/Dickinson	90
Nevada DOT/District II	90-100
Newport News Public Works	50
NHDOT-Highway Maintenance	150

ODOT	90
ODOT	Up to 90 days
ODOT Delivery and Operations D12	60-90days
ODOT Hwy Maintenance district 1	2 months
ODOT Maintenance 1 2C	90 Days
ODOT region 1 2B	2 months
ODOT Region 2	60 days
ODOT Region 3, District 7, Highway	60
ODOT Region 4 Dist.11	90
ODOT, D-12	90
ODOT, Highway, D8	30 Days
ODOT/Hwy/12	2 months
Oregon Department of Transportation; Highway/Maintenance/2C	2 months
Oregon Dept. of Transportation/Highway/High Cascade Area	3 months
Oregon Dept. of Transportation	3weeks
Oregon DOT	2-3 months
Patton Township, Centre County, PA	45
Pierce County Planning and Public Works, Maintenance and Operations Division	4-12 weeks
Public Works Germantown, TN	2 months
Road Commission for Oakland County	For temporary workers it is a few months. We post and wait for the contractors to start shutting down. FTE is about 30 days.
Syracuse City Utah	45
Town of Waterford, CT	60 days
Transportation	2 months
Unified Government/Street Division	70
Vermont Agency of Transportation	40
Vermont Agency of Transportation	75
Village of Algonquin, IL DPW	2 months
Village of Bartlett / Streets	6 weeks
Village Of New Lenox - Streets	6 weeks
VTrans	90 Days
VTrans/Highway/Maintenance/District 4	90
WSDOT	1 to 2 months
WV DOH	120
WVDOT	2 Months
WVDOT Division of Highways	90-180 days
WYDOT	2 months

WYDOT Dist 3 Southwest AMS	30-45
WYDOT/D1	30

Operations

Winter Season

Respondents were asked to provide information on the official start and end dates of their typical winter operations season, 99 respondents provided information on their season (Table 31). Start dates ranged between October and December, with mid-October to mid-November being the most common start for winter operations season. There was a larger range in end dates, the end of winter operations season ranged from February to June. Late-March to mid-April were the most common end date.

Table 31. Winter Season Start and End Dates

Agency	State Date	End Date
	November	End of April
	November 1	March 1
	oct 15th	April 15
	12/01/2019	03/31/2020
	nov 1	april 15
	October 1st	April 30th
	10/31	3/31
Alaska DOT&PF Northern Region Highways & Aviation	10/1	5/15
AOT	12/19	3/20
AOT	10 /25	5 /05
California Dept. of Transportation	November 15	March 30
CalTrans District 09	November 16th	may/june
City of Bozeman Streets	November	April
City of Charlottesville, VA	December 1	April 1
City of Crystal	Mid October	Mid April/May
City of Crystal Lake	November 15	April 15
City of Fairway, KS Public Works Dept	October	April
City of Farmington Hills, MI-DPW	10-31	5-1
City of Fishers, IN	October	April
City of Fridley Public Works Department	November 1	April 1
City of Groveport	November 1	March 31
City of Kirtland	October 20	April 20
City of Littleton Public Works Streets Division	Oct 1	May 1
City of Oakdale Public Works	10/15	4/15
City of Richmond	December	April
City of St. Paul	November 15	April 15

Denver Department of Transportation and Infrastructure/Street Maintenance/Asset Management	Nov 1	Mar 31
Department of Transportation	November 1	April 30
DISTRICT 1	11-1-19	3-31-20
District 1	Oct, 1	May,15
District 4 Hereford	Nov.15	April 30
DOH	Nov. 1	March 31
Highways DoH d413	11-15-	4-15-
Highway 7300 D-8 R-3	NOV 25TH	APRIL 15TH
Highway/Maintenance/ District 4	11/1	4/1
Idaho trans dept	Nov. 1	March 31
Idaho Trans Dept	11/1	3/31
Idaho Trans. Dept. District 2	November 1st	April 15th
Idaho Transportation Department	11/1/2020	4-1-2020
Idaho Transportation Department District 3	November 1	April 1
ITD	October 1	march 30
ITD	11/1/2020	4/1/2021
ITD D5	11-1	4/30
ITD/district 4/Shoshone/Fairfield	11-01-19	4/1/2020
Kansas DOT	October 1st	May 1st
MaineDOT	November 1st	May 1st
MaineDOT	October 1	May 30
MaineDOTRegin4	10/01	4/01
Mass DOT D3B	11/15	4/15
MDOT/SHA	10/19	5/20
MEDOT Region 5	November	March
Minnesota Department of Transportation	October 15 so	April 15 or so
MnDot/District 7	October 1	April 15
NDDOT/Dickinson	Nov 15	April 1
Nevada DOT/District II	10-1	5-1
Newport News Public Works	October	April
NHDOT-Highway Maintenance	11/1/19	3/31/20
ODOT	11/01	03/31
ODOT	October 1st	May 31st
ODOT Delivery and Operations D12	November 1,	April 1,
ODOT Hwy Maintenance district 1	11/15/2019	4/15/2015
ODOT Maintenance 1 2C	November 1	April 30
ODOT region 1 2B	Nov 15th	March 15th
ODOT Region 2	November 1	March 31
ODOT Region 3, District 7, Highway	October	March
ODOT Region 4 Dist.11	11-1-2020	3-31-2021

ODOT, D-12	Nov 1st	April 1st
ODOT, Highway, D8	October 1	April 1
ODOT/Hwy/12	11/1/2020	3/30/2020
Oregon Department of Trans.	11/1	3/31
Oregon Department of Transportation; Highway/Maintenance/2C	November 15	March 15
Oregon Dept. of Transportation/Highway/High Cascade Area	October 1	Generally end of April, sometimes longer.
Oregon Dept. of Transportation	NOV	MARCH
Oregon DOT	November	February
Patton Township, Centre County, PA	November 1	April 1
PennDOT	11012019	05012020
Pierce County Planning and Public Works, Maintenance and Operations Division	Nov 15th	March 15th
Public Works Germantown, TN	December 15	March 30
Road Commission for Oakland County	The Monday before Thanksgiving	First week in April
SHA	October/1/20	April / 15/20
Syracuse City Utah	Nov 1	Mar 30
Town of Waterford, CT	November 1	April 1
Transportation	November 8th	April 1st
Transportation/Highways/District 5	November 1st	March 31st
Unified Government/Street Division	10/15	4/1
Vermont Agency of Transportation	October 1	May 15
Vermont Agency of Transportation	Nov 1	Apr 1
Village of Algonquin, IL DPW	October 15	April 1
Village of Bartlett / Streets	10/31	4/01
Village Of New Lenox - Streets	November 1	April 1
VTrans	Oct	May
VTrans/Highway/Maintenance/District 4	12/1	4/1
WSDOT	Nov	April
WV DOH	November 1st	March 31st
WVDOT	November 1	March 31
WVDOT Division of Highways	November 1	March 31
WYDOT	1 Oct	31 May
WYDOT Dist 3 Southwest AMS	October 1	May 1
WYDOT/D1	October 1	April 30

Average Snowfall

Respondents were asked to provide information on their average annual snowfall, 92 respondents provided information on their average snowfall (Table 32). Average snowfall varied widely, from less than an inch to 600 inches. The average annual snowfall among respondents was 64 inches.

Table 32. Average Annual Snowfall

Agency	Average Annual Snowfall
	8
	8-12"
	21
	30-36 inches
	56
	5 feet
	Varies across the state, last winter varied from 47" - 147". Average was 72"
Alaska DOT&PF Northern Region Highways & Aviation	80"
AOT	24"
AOT	60 to 80 inches give or take
California Dept. of Transportation	365 inches
CalTrans District 09	400"
City of Bozeman Streets	86"
City of Charlottesville, VA	17'
City of Crystal Lake	32 inches
City of Fairway, KS Public Works Dept	20-25 inches
City of Farmington Hills, MI-DPW	45 Inches
City of Fishers, IN	25"
City of Fridley Public Works Department	45
City of Groveport	35 inches
City of Kirtland	75 inches
City of Littleton Public Works Streets Division	60 inches
City of Oakdale Public Works	60"
City of St. Paul	50 inches
Denver Department of Transportation and Infrastructure/Street Maintenance/Asset Management	59"
Department of Transportation	Ave. snowfall range varies between 25" to 60" in different parts of the state
District 1	Cheyenne Wy 58 inches - Laramie Wy 64 inches - Rawlins Wy 41 inches
DISTRICT 1	103 inches
District 4 Hereford	40"

DOH	80 inches
Highways DoH d413	24``
Highway 7300 D-8 R-3	3 TO 5"
Highway/Maintenance/ District 4	12"
Idaho trans dept	18 inch
Idaho Trans Dept	30 inch
Idaho Trans. Dept. District 2	On Lolo Pass I believe about 400 inches. It will compact to about 8' in the average year on top of Lolo Pass by April. Kooskia area will have a foot of snow sometime during the winter.
Idaho Transportation Department	48 inches
Idaho Transportation Department District 3	13" to 60 "
ITD	Varies
ITD D5	70 inches
ITD/district 4/Shoshone/Fairfield	61 inches
Kansas DOT	20-30 inches
MaineDOT	75" +
MaineDOT	60 to 120 inches
MaineDOTRegin4	50-70 inches
Mass DOT D3B	50-100 inch
MDOT/SHA	40 inches
MEDOT Region 5	120"
Minnesota Department of Transportation	70 inches
MnDot/District 7	64"
NDDOT/Dickinson	34"
Nevada DOT/District II	100-400"
Newport News Public Works	<1 inch
NHDOT-Highway Maintenance	63 "
ODOT	12-24
ODOT	4 to 5 ft.
ODOT Delivery and Operations D12	18-24 inches
ODOT Hwy Maintenance district 1	4 inches
ODOT Maintenance 1 2C	50 inches
ODOT region 1 2B	6 inches
ODOT Region 2	8"
ODOT Region 3, District 7, Highway	6"
ODOT Region 4 Dist.11	50 inch
ODOT, D-12	13"
ODOT, Highway, D8	6-8 inches
ODOT/Hwy/12	18 inches

Oregon Department of Trans.	0-10
Oregon Department of Transportation; Highway/Maintenance/2C	4 -6"
Oregon Dept. of Transportation/Highway/High Cascade Area	400" - 600"
Oregon Dept. of Transportation	3
Oregon DOT	4-10 inches
Patton Township, Centre County, PA	46
PennDOT	Varies throughout the state from 15 inches to 120 inches
Pierce County Planning and Public Works, Maintenance and Operations Division	0-12"
Public Works Germantown, TN	4 inches
Road Commission for Oakland County	42 inches
Syracuse City Utah	40 inches
Transportation	120 inches
Transportation/Highways/District 5	65 inches (depending on location)
Unified Government/Street Division	20"
Vermont Agency of Transportation	110"
Vermont Agency of Transportation	125
Village of Algonquin, IL DPW	37
Village of Bartlett / Streets	40"
Village Of New Lenox - Streets	30 inches
VTrans	1-2 ft
VTrans/Highway/Maintenance/District 4	100 inches
WV DOH	18"
WVDOT	10"
WVDOT Division of Highways	27" - 64" throughout 5 county area
WYDOT	46
WYDOT/D1	65"

Average Number of Activation Events

Respondents were then asked to provide the average number of snow and ice events that required their agency to activate, a total of 91 respondents provided information (Table 33). The average number of activation events ranged from 0 to over 100. Many respondents mention that the number of events requiring activation vary depending on geography or vary season to season. Some respondents mention that they are operating 24/7 or that they operate every day that units are in rotation.

Table 33. Average Number of Snow/Ice Events Requiring Activation

Agency	Average Number of Snow/Ice Events Requiring Activation
	32
	15-20
	27
	11
	20-26 times
	5-6
	40
Alaska DOT&PF Northern Region Highways & Aviation	15-20
AOT	30
AOT	35 40 give or take
CalTrans District 09	125
City of Bozeman Streets	10
City of Crystal	30-40
City of Crystal Lake	15
City of Fairway, KS Public Works Dept	8-10
City of Farmington Hills, MI-DPW	40
City of Fishers, IN	8-10
City of Fridley Public Works Department	9 / 13 for snow and ice, respectively
City of Groveport	25
City of Kirtland	50
City of Littleton Public Works Streets Division	14
City of Oakdale Public Works	25
City of Richmond	5
City of St. Paul	20-30
Denver Department of Transportation and Infrastructure/Street Maintenance/Asset Management	24
Department of Transportation	12 storms average requiring activation of more than 50 percent of work force
DISTRICT 1	100 +
District 1	Between the actual storm and the wind that precedes and follows it's everyday that we have units in rotation.
District 4 Hereford	7 to 9
DOH	20
Idaho trans dept	26 events
Idaho Trans Dept	45
Idaho Trans. Dept. District 2	About 60 plus or minus some on Lolo Pass.

Idaho Transportation Department	80
Idaho Transportation Department District 3	Range from 15 to 100
ITD	15
ITD	20 to 30
ITD D5	58
ITD/district 4/Shoshone/Fairfield	41-61 events
Kansas DOT	15
MaineDOT	36
MaineDOT	Roughly 40 events
MaineDOTRegin4	35
Mass DOT D3B	20-30
MDOT/SHA	10
MEDOT Region 5	30
Minnesota Department of Transportation	25-30
MnDOT/District 7	22
NDDOT/Dickinson	25
Nevada DOT/District II	40
Newport News Public Works	3
NHDOT-Highway Maintenance	27 in the southern portion of the state, likely 60 + in the northern districts
ODOT	30
ODOT	almost daily
ODOT Delivery and Operations D12	80
ODOT Hwy Maintenance district 1	20/30 times per winter
ODOT Maintenance 1 2C	90 days
ODOT region 1 2B	one
ODOT Region 2	20
ODOT Region 3, District 7, Highway	15
ODOT Region 4 Dist.11	6
ODOT, D-12	60
ODOT, Highway, D8	90+ Days
ODOT/Hwy/12	45
Oregon Department of Trans.	3
Oregon Department of Transportation; Highway/Maintenance/2C	4
Oregon Dept. of Transportation/Highway/High Cascade Area	we operate 24/7
Oregon Dept. of Transportation	6
Oregon DOT	0-30

Patton Township, Centre County, PA	16
PennDOT	Statewide Average activation
Pierce County Planning and Public Works, Maintenance and Operations Division	2+
Public Works Germantown, TN	2
Road Commission for Oakland County	16
Syracuse City Utah	24
Town of Waterford, CT	10
Transportation	50
Transportation/Highways/District 5	30
Unified Government/Street Division	12
Vermont Agency of Transportation	25
Vermont Agency of Transportation	30 +/-
Village of Algonquin, IL DPW	21
Village of Bartlett / Streets	20
Village Of New Lenox - Streets	28
VTrans/Highway/Maintenance/District 4	80
WSDOT	4 to 6
WV DOH	7
WV DOT	3 to 7 times a week
WV DOT Division of Highways	varies
WYDOT	varies among crews
WYDOT/D1	120

Jurisdiction Size

Respondent jurisdiction size varied widely, population size ranged from just 300 people to over 6.5 million (Table 34). The average population size among the respondents was 386,027 people.

Table 34. Jurisdiction Population Size

Agency	Jurisdiction Population
	6400
	25,600
	40000
	65000
Alaska DOT&PF Northern Region Highways & Aviation	100,000
AOT	100,000
CalTrans District 09	15000
City of Bozeman Streets	50,000
City of Charlottesville, VA	48,000
City of Crystal	23,000

City of Crystal Lake	40000
City of Fairway, KS Public Works Dept	4,000
City of Farmington Hills, MI-DPW	80K
City of Fishers, IN	98,000
City of Fridley Public Works Department	28000
City of Groveport	5,800
City of Kirtland	7,000
City of Littleton Public Works Streets Division	45,000
City of Oakdale Public Works	30,000
City of Richmond	200000
City of St. Paul	300,000
Denver Department of Transportation and Infrastructure/Street Maintenance/Asset Management	706,000
Department of Transportation	CT Population is 3.55 million
District 1	Cheyenne Wy 64,000 - Laramie Wy 32,000 - Rawlins Wy 9000
District 4 Hereford	alot
DOH	11,626
Highway/Maintenance/ District 4	40,000
Idaho trans dept	15,000
Idaho Trans Dept	30000
Idaho Trans. Dept. District 2	Kooskia has 700 people. Sites about 200. Syringa unincorporated. Lowell unincorporated. Very rural.
Idaho Transportation Department	4000
Idaho Transportation Department District 3	600,000
ITD	60,000
ITD D5	7100
ITD/district 4/Shoshone/Fairfield	Camas County -1106; Gooding county-15,412; Lincoln county - 5171
Kansas DOT	3 million
MaineDOT	Roughly 600,000 people
MaineDOT	1.326 million statewide
MaineDOTRegin4	5000
Minnesota Department of Transportation	5.6 million
MnDot/District 7	80,000
NDDOT/Dickinson	30000
Nevada DOT/District II	700,000
Newport News Public Works	183,000
NHDOT-Highway Maintenance	1,350,000
ODOT	300
ODOT Delivery and Operations D12	less than 10,000

ODOT Hwy Maintenance district 1	52,354
ODOT Maintenance 1 2C	600000
ODOT region 1 2B	812,855
ODOT Region 2	25,000
ODOT Region 3, District 7, Highway	15,000
ODOT Region 4 Dist.11	8,000
ODOT, D-12	25000
ODOT, Highway, D8	87,500
ODOT/Hwy/12	23,000
Oregon Department of Trans.	300k
Oregon Department of Transportation; Highway/Maintenance/2C	65000
Oregon Dept. of Transportation/Highway/High Cascade Area	500
Oregon Dept. of Transportation	75,000
Oregon DOT	250,000
Patton Township, Centre County, PA	16,000
Pierce County Planning and Public Works, Maintenance and Operations Division	802,000 total; 372,000 unincorporated
Public Works Germantown, TN	40,123
Road Commission for Oakland County	1.2 million
Syracuse City Utah	30,000
Town of Waterford, CT	20,000
Transportation	100,000
Unified Government/Street Division	150,000
Vermont Agency of Transportation	75,000
Vermont Agency of Transportation	125000
Village of Algonquin, IL DPW	31,000
Village of Bartlett / Streets	45,000
Village Of New Lenox - Streets	27,000
WSDOT	300,000 +
WV DOH	110000
WVDOT	5000
WVDOT Division of Highways	127,412 throughout 5 county area
WYDOT	93,000
WYDOT/D1	200000
	6.5 million, entire state of Wisconsin

Total Lane Miles

Respondents were then asked to provide information on their total number of lane miles (or if not available, then their center-line miles), a total of 93 respondents provided information on their lane

miles (Table 35). Lane miles ranged from 42 to 45,000 miles with an average of 2,735.1 miles. Center line miles ranged from 95 to 744 miles with an average of 272.1 miles.

Table 35. Total Lane Miles

Agency	Total Lane Miles
	225 center line miles
	154
	284
	478
	520
	365 road mile, 730 lane miles
	745
Alaska DOT&PF Northern Region Highways & Aviation	2,000
AOT	85
AOT	88
California Dept. of Transportation	751
CalTrans District 09	1600
City of Bozeman Streets	230 CL
City of Charlottesville, VA	328
City of Crystal	90
City of Crystal Lake	300
City of Fairway, KS Public Works Dept	42 lane miles
City of Farmington Hills, MI-DPW	300
City of Fishers, IN	397 center lane
City of Fridley Public Works Department	200
City of Kirtland	70
City of Littleton Public Works Streets Division	355
City of Oakdale Public Works	95 center line miles
City of St. Paul	1900
Denver Department of Transportation and Infrastructure/Street Maintenance/Asset Management	5760
Department of Transportation	10,870
DISTRICT 1	110.76
District 1	2869.45 Lane Miles
District 4 Hereford	800
DOH	400
Highway 7300 D-8 R-3	500
Highway/Maintenance/ District 4	300
Idaho Trans Dept	240
Idaho trans dept	409

Idaho Trans. Dept. District 2	120 miles
Idaho Transportation Department	262
Idaho Transportation Department District 3	2700
ITD	300
ITD	440
ITD D5	285
ITD/district 4/Shoshone/Fairfield	282
Kansas DOT	25,000
MaineDOT	We have 62 plow routes which average roughly 12 center-line miles per route
MaineDOT	8200
MaineDOTRegin4	170.5
MDOT/SHA	700
MEDOT Region 5	1759
Minnesota Department of Transportation	30,341
MnDOT/District 7	3346
NDDOT/Dickinson	2259
Newport News Public Works	547.88
NHDOT-Highway Maintenance	8,321
ODOT	179
ODOT	450
ODOT Delivery and Operations D12	550 lane miles
ODOT Hwy Maintenance district 1	266
ODOT Maintenance 1 2C	190
ODOT region 1 2B	200
ODOT Region 2	124 center line miles
ODOT Region 3, District 7, Highway	300
ODOT Region 4 Dist.11	470 lane miles
ODOT, D-12	420 lane miles
ODOT, Highway, D8	337 Miles
ODOT/Hwy/12	429 LM
Oregon Department of Trans.	500
Oregon Department of Transportation; Highway/Maintenance/2C	147
Oregon Dept. of Transportation/Highway/High Cascade Area	360
Oregon Dept. of Transportation	460
Oregon DOT	760
Patton Township, Centre County, PA	118
PennDOT	45000
Pierce County Planning and Public Works, Maintenance and Operations Division	3150

Public Works Germantown, TN	220 center lane miles
Road Commission for Oakland County	1,500 state miles (MDOT) , 2,700 Road Commission
Syracuse City Utah	210 single lane (105 centerline). All local roads are two-lane.
Town of Waterford, CT	120
Transportation	1400
Unified Government/Street Division	2400
Vermont Agency of Transportation	1,220
Vermont Agency of Transportation	1636
Village of Algonquin, IL DPW	260
Village of Bartlett / Streets	142 center line miles
Village Of New Lenox - Streets	150
VTrans	100
VTrans/Highway/Maintenance/District 4	1150
WSDOT	674
WV DOH	642
WVDOT	800
WVDOT Division of Highways	3,926 road miles
WYDOT	3001
WYDOT Dist 3 Southwest AMS	1300
WYDOT/D1	3017
	35,177

Maintenance Activities

Respondents were asked if their agency is responsible for maintaining parking lots and rest areas (Table 36). Most respondents (60%) were not maintaining parking lots (Figure 14), and it was about a 50/50 split on respondents maintaining rest areas (Figure 15).

Table 36. Do you maintain parking lots or rest areas?

Responsible for Maintaining	Total Respondents	Yes	Percentage of Total Responses	No	Percentage of Total Responses
Parking Lots	N=100	40	40.0%	60	60.0%
Rest Areas	N=101	54	53.5%	47	46.5%

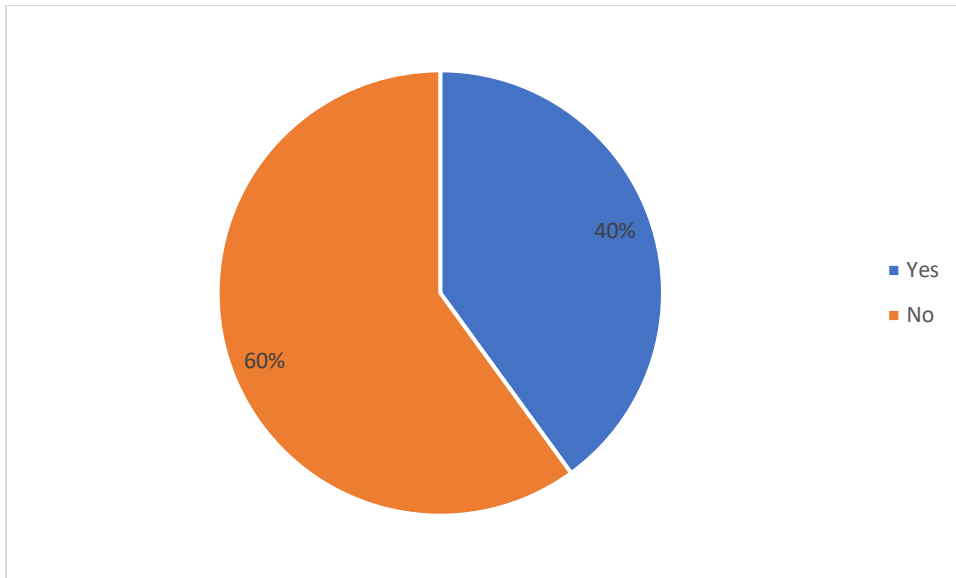


Figure 14. Do you maintain parking lots?

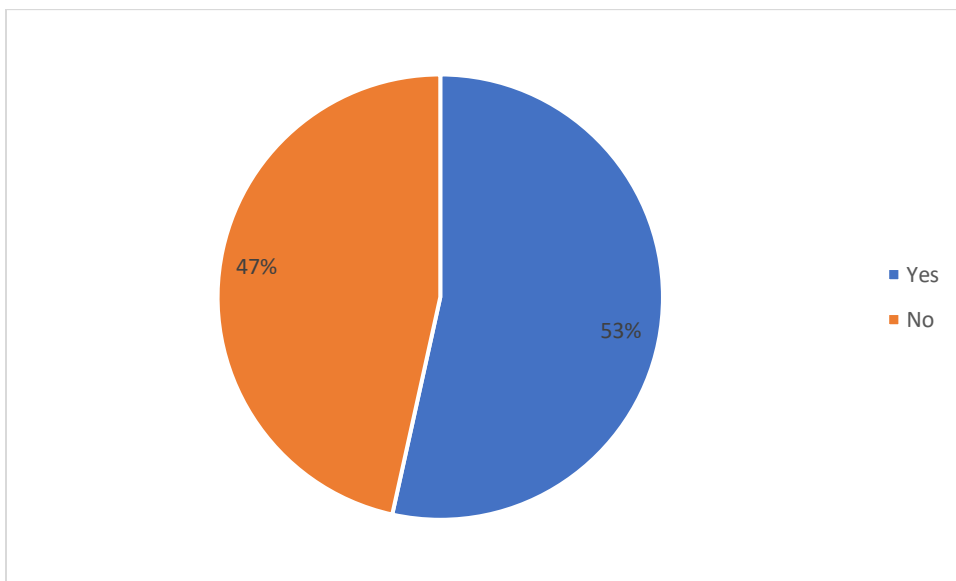


Figure 15. Do you maintain rest areas?

Snow Duty Shift Arrangement

Respondents were then asked to provide information on their regular snow duty shift arrangement, a total of 100 respondents provided information (Figure 16). The most common shift arrangement was a 12-hour shift, with 54% of respondents using this shift arrangement. The least common (9% of respondents) snow duty shift arrangement was 10-hour shifts. A total of 16 respondents (16%) responded with other. These respondents noted that their snow duty shifts can range from 8 to 16 hour shift to upwards of 24/7 during a storm (Table 37).

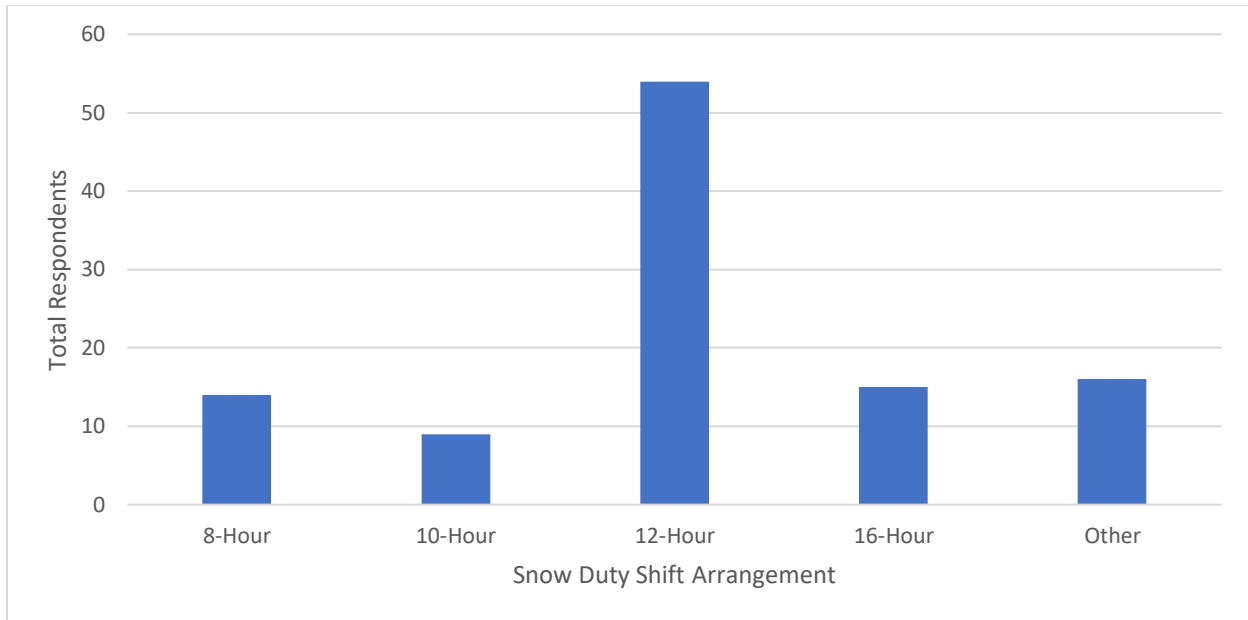


Figure 16. Snow Duty Shift Arrangement

Table 37. Other Snow Duty Shift Arrangements

Agency	Other Text
	24
	sha will work a round
	full staff activated, rotate drivers as needed
	Varies per county and per storm. We have 24 hour routes while snowing.
AOT	8 to 16 hrs
Department of Transportation	Personnel work until storm is over
District 4 Hereford	Until roads and shoulders are clear
MaineDOT	12 hour shifts are used during off-hours and long storms
MaineDOT	15 hour shifts
MaineDOTRegin4	can work over
Mass DOT D3B	duration
MDOT/SHA	until event is done
NHDOT-Highway Maintenance	24/7 when snowing
ODOT/Hwy/12	24/7
Village Of New Lenox - Streets	As necessary w/DOT Breaks
VTrans/Highway/Maintenance/District 4	more if necessary

Recruitment

Worker Shortages

Respondents were asked if their agency had experienced a shortage in winter maintenance workers during the 2019-2020 winter season. Of the 101 respondents who answered this question, roughly half had experienced a shortage (Figure 17).

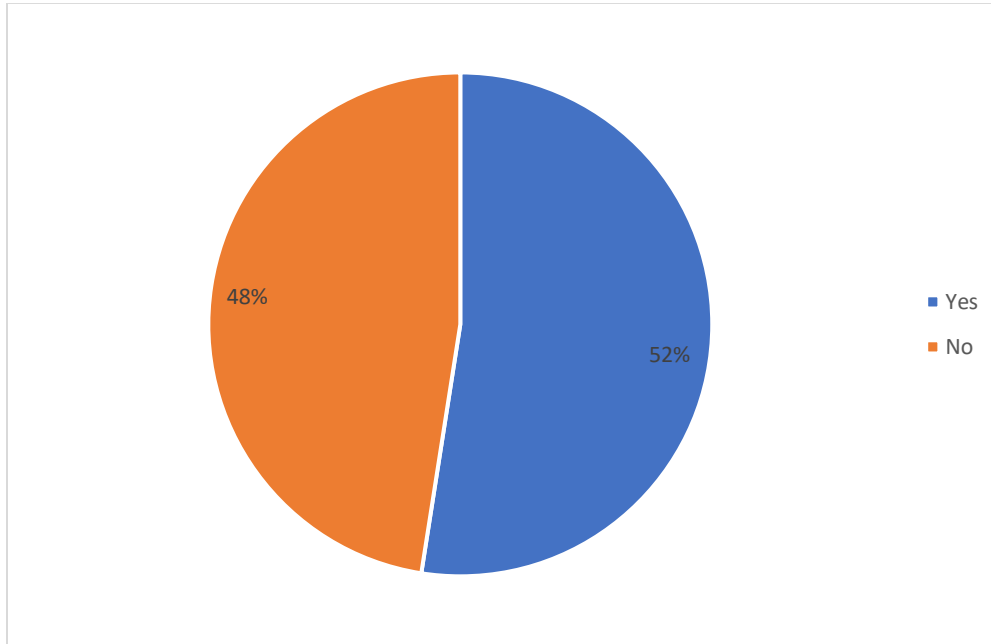


Figure 17. Did your agency experience a shortage of winter maintenance workers during the 2019-2020 winter season?

A follow-up question asked those that had experienced a shortage (42.6%, N=43) to provide the approximate percentage of the shortage (Table 38). This percentage varied widely among respondents from less than 5% to greater than 80%. The average percentage was 18.2%.

Table 38. Approximate Percentage of Worker Shortage During the 2019-2020 Winter Season

Agency	Shortage	What was the approximate percentage of the shortage?
	Yes	12%
	Yes	20
	Yes	We should have the same contractor for a 12 hours staffing.
Alaska DOT&PF Northern Region Highways & Aviation	Yes	6-10%
AOT	Yes	20
California Dept. of Transportation	Yes	35%
CalTrans District 09	Yes	80%
City of Farmington Hills, MI-DPW	Yes	10%
City of Fishers, IN	Yes	20%
City of Littleton Public Works Streets Division	Yes	10%

City of St. Paul	Yes	10%
Department of Transportation	Yes	10 percent
Idaho Trans. Dept. District 2	Yes	We had to hire 4 people to fill vacancies across the Winter period.
Idaho Transportation Department	Yes	25
ITD/district 4/Shoshone/Fairfield	Yes	20%
Kansas DOT	Yes	30
MaineDOT	Yes	10%
MaineDOT	Yes	10 to 15 percent
MaineDOTRegin4	Yes	1.44
Mass DOT D3B	Yes	10-15%
NDDOT/Dickinson	Yes	5
Nevada DOT/District II	Yes	95
Newport News Public Works	Yes	22%
NHDOT-Highway Maintenance	Yes	12%
ODOT	Yes	10%
ODOT	Yes	10%
ODOT Maintenance 1 2C	Yes	3%
ODOT Region 4 Dist.11	Yes	10
ODOT, D-12	Yes	10
ODOT, Highway, D8	Yes	25%
ODOT/Hwy/12	Yes	3%
Patton Township, Centre County, PA	Yes	2
PennDOT	Yes	10
Road Commission for Oakland County	Yes	50%
Unified Government/Street Division	Yes	15%
Village of Algonquin, IL DPW	Yes	5%
VTrans/Highway/Maintenance/District 4	Yes	5
WSDOT	Yes	10% TO 20%
WV DOH	Yes	65
WVDOT	Yes	5%
WYDOT	Yes	10
WYDOT Dist 3 Southwest AMS	Yes	1
WYDOT/D1	Yes	10

Recruitment Strategies

Recruitment strategies can vary widely depending on the department. Respondents were asked how much control they had over the recruitment processes (e.g. job posting language, selection of applicants for interviews, interview questions, salary offers, etc.) (Figure 18, Table 39). Most respondents felt that they had some control (66.3% of respondents) or full control (23.2% of respondents). Few felt like they had no control over recruitment efforts.

Table 39. Amount of Control Over Recruitment Processes

Control Over Recruitment Process	Total Respondents	Percentage of Total Respondents (N=95)
Full Control	22	23.2%
Some Control	63	66.3%
No Control	10	10.5%

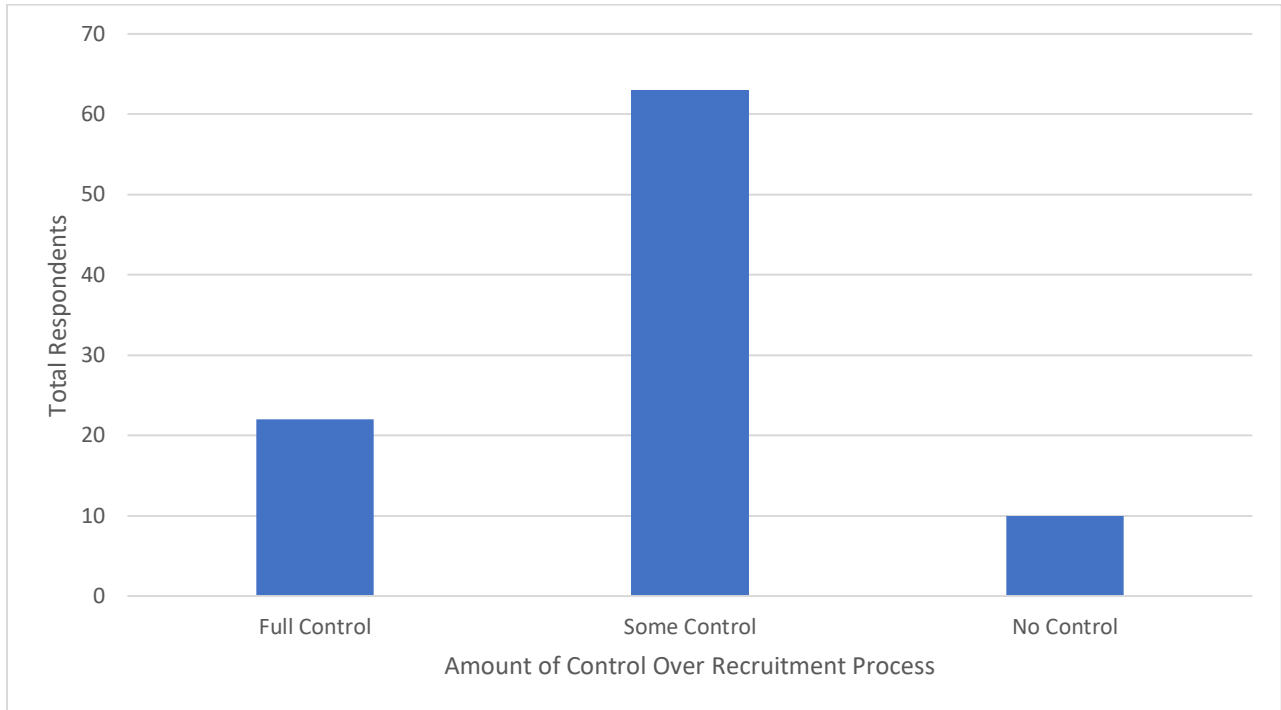


Figure 18. Amount of Control Over Recruitment Processes

Respondents were asked which factors negatively impacted their agency’s ability to recruit and hire winter maintenance staff, 94 respondents provided information on the negative impacts to their recruitment efforts (Table 40). Most respondents (72.3%) felt that their pay scale was not competitive enough with the private sector. Additionally, respondents struggled with difficulty finding candidates with requisite minimum skills or experience levels (60.6% of respondents), in part due to the pay scale not being competitive enough with other public sector jobs. Few respondents were struggling with poor working conditions impacting recruitment (7.4%), or with rigidity of position classification and the job description system (8.5% of respondents). Twelve respondents stated “other” and noted issues with not enough candidates, budget, the hiring process being too long, and a lack of housing in rural areas (Table 41).

Table 40. Negative Factors Impacting Ability to Recruit and Hire

Factors Negatively Impacting Ability to Recruit and Hire	Total Respondents	Percentage of Total Respondents (N=94)
Pay scale not competitive enough with private sector	68	72.3%
Pay scale not competitive enough with other public sector jobs	48	51.1%

Benefits package (health insurance, pension, etc.) not competitive	10	10.6%
Work schedule (days/hours) unfavorable	28	29.8%
Difficulty finding candidates with requisite minimum skills/experience levels	57	60.6%
Physical and drug test pre-employment requirements	22	23.4%
Background checks (criminal, civil, driving records)	12	12.8%
Poor or unsuitable prior employment record	16	17.0%
CDL requirement (pre-employment)	31	33.0%
Routine job duties (too physical, boring, dirty, etc.)	14	14.9%
Working conditions (poor facilities, equipment, exposure to hazardous materials, traffic, etc.)	7	7.4%
Snow duty (shifts/duty hours, standby restrictions, unpredictability, etc.)	33	35.1%
Rigidity of position classification and job description system	8	8.5%
Lack of career development, advancement opportunities	14	14.9%
Poor perception of job	14	14.9%
Hiring process too slow, cumbersome	42	44.7%
I do not know	4	4.3%
Other	12	12.8%

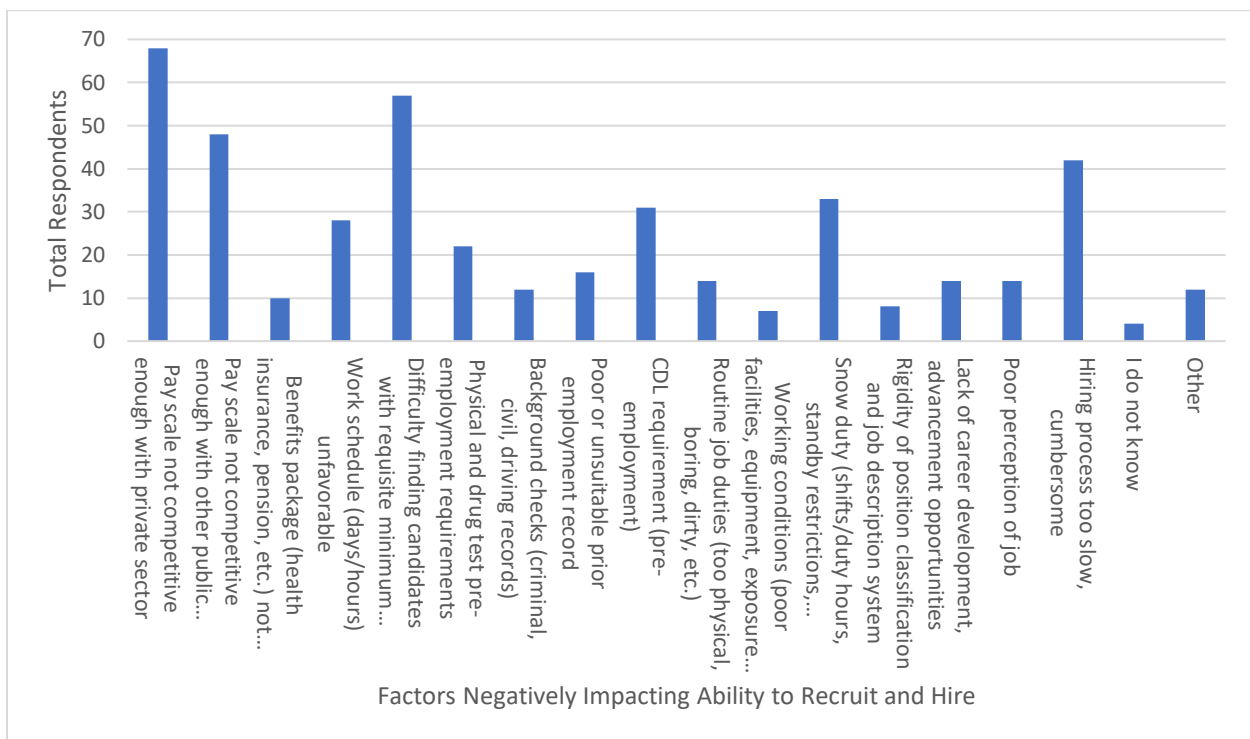


Figure 19. Negative Factors Impacting Ability to Recruit and Hire

Table 41. Other Negative Factors Impacting Recruitment

Agency	Other Negative Factors Impacting Ability to Recruit
CalTrans District 09	hiring process takes too long and they find other work
City of Crystal Lake	not enough candidates
Denver Department of Transportation and Infrastructure/Street Maintenance/Asset Management	Budget due to COVID
DISTRICT 1	location, nepotism small towns everyone is related
Idaho Transportation Department District 3	shortage of affordable housing is some areas of the District
ITD	make more on unemployment
ITD/district 4/Shoshone/Fairfield	Very rural locations - no housing available
MaineDOT	Our Transportation Workers just received a stipend, but prior to last winter, pay was the primary issue
ODOT, Highway, D8	Budget
Syracuse City Utah	I do not have a problem recruiting full time employees.
Unified Government/Street Division	Residency Requirement
	Wisconsin DOT does not hire any plow drivers, each county does individually

Respondents were asked a series of question related to recruitment strategies used to bring in good candidates for winter maintenance positions (Table 42). Respondents were asked to provide the methods their agency used to attract job applicants, 82 respondents provided information on their recruitment methods. Commonly used methods included word of mouth and advertising in newspapers, radio, social media, job posting websites like Indeed, and on agency websites. Some have utilized job fairs to get the word out about employment opportunities. Others have used local union job boards. One respondent mentioned having large advertisements on their plow trucks. Another mentioned their agency had a specific pathway for part-time employees to move into full-time employment. One respondent called out the use of headhunters.

A follow up question asked respondents which method they felt was the most successful recruitment strategy, 73 respondents provided information on their successful strategies. Many respondents felt that word of mouth was the most effective recruitment strategy. Also common was using advertising on agency websites, social media, and at job fairs. One respondent mentioned success with incentive programs, and another mentioned a CDL program that has helped bring in new employees.

Table 42. Recruitment Methods

Agency	What methods does your agency use to attract job applicants?	What are the most effective/successful recruitment strategies used in your agency?
	Job fairs	
	Online Ads	
		Word of mouth
	Locally asking potential folks to apply, Persons off crews watch for good future employees and share with Manager	Word of mouth
	State website	Internal advertisement, walk in's
	Pay is bad	Good pay health care package
Alaska DOT&PF Northern Region Highways & Aviation	Union Call out, State web page (Workplace Alaska), social media, Public Outreach, word of mouth	Word of mouth.
AOT	Job fairs	
AOT	Not much other then looking on there web site	
California Dept. of Transportation	Local news media, social media, job fairs	
CalTrans District 09	Job fairs, local ads, radio, newspaper, banners posted on facilities and other locations, EDD, social media, statewide job postings	Face to face and try to recruit
City of Bozeman Streets	Nothing special	4/10 shifts in the summer. Lots of overtime.
City of Charlottesville, VA	Advertise locally, and use social media	Passive recruitment
City of Crystal	NA	NA
City of Crystal Lake	List serv, word of mouth	Word of mouth
City of Fairway, KS Public Works Dept	We go years without vacancies and have had our best results via word of mouth	Word of mouth
City of Farmington Hills, MI-DPW	Indeed, Local city webpage	Word of Mouth, Local webpage
City of Fishers, IN	Paper, social media, web site, head hunters, et al..	Web page

City of Fridley Public Works Department	Websites, social media, internet recruiters, job fairs	Internet recruiters
City of Kirtland		room to advance
City of Oakdale Public Works	Internal postings, electronic postings on city website and other local websites, advertising within local professional organizations, word of mouth from current employees, hire current summer seasonal employees	Website advertising
City of St. Paul	Ability to get CDL upon employment, social media, open houses, large advertisements on the side of plow trucks	Not much is working right now. The applicant pool continues to reduce each year that we do hiring. Targeted and pay social media advertising was fairly effective. The CDL program has help expand the pool as well.
Denver Department of Transportation and Infrastructure/Street Maintenance/Asset Management	Online posting	
Department of Transportation	Employment announcements through the Department of Administrative Services	Job posting through internal and external methods
DISTRICT 1		Word of mouth
District 1	Public postings and word of mouth	Public postings and word of mouth
District 4 Hereford	Internet	Don't know
DOH	DOH Job Page	Word of mouth
Highway 7300 D-8 R-3	Outside media, newspapers etc.	ODOT job page
Highway/Maintenance/ District 4	Internet	ODOT jobs.com
Idaho trans dept	Internet, face book, newspaper, word of mouth, dept. of Labor	Internet
Idaho Trans Dept	Benefits and training program. stable work.	Benefits and training program. stable work.
Idaho Trans. Dept. District 2	Newspaper ads, internet advertisement. On ITD website for jobs	Word of mouth of good employees who know someone and convince them to apply.
Idaho Transportation Department	Local Job Services, Radio, Newspaper, Social Media	Social Media
Idaho Transportation Department District 3	Job announcements, Job Fairs,	

ITD	Internet, social media	Internet, social media
ITD D5	Tells about our good benefit	Talk about our benefit package
ITD/district 4/Shoshone/Fairfield	Online -- social media	Local postings,
Kansas DOT	Posters at business, variable message boards, job fairs	We don't have one
MaineDOT	Advertising, job site postings, occasionally working with trade schools, occasionally manned tables during fairs, signs in front of our lots	Signs in front of the lots saying "Help Wanted" have helped, putting postings on our website also helps
MaineDOT	Media, Social Media, Job fairs	Social Media
MaineDOT/Region 4	On the web	Pay incentive \$2000.00 at the end of season
MDOT/SHA	Word of mouth	word of mouth
MEDOT Region 5	Computer, newspapers, career centers	Computer
Minnesota Department of Transportation	Job fairs, active advertising, employee advocating, school/community visits	Job fairs and community visits
MnDOT/District 7	Pathway for PT employees to become fulltime	Word of mouth from current employees. We are currently doing a Fairmont amount of career fairs targeting high school age kids to try and reach them early.
NDDOT/Dickinson	Websites, social media, print, flyers	Unknown. This is handled by HR
Nevada DOT/District II	Web, Social Media, Banners	
Newport News Public Works	Advertisements	Advertisements
NHDOT-Highway Maintenance	Not enough. General state position website, employment security website, Indeed.com, very rarely newspaper, signs at sheds, word of mouth	Signs at sheds/word of mouth
ODOT	Craigslist, State Employment Site, Newspaper, Radio	
ODOT	Workday	Paper
ODOT Delivery and Operations D12	Advertising	Company web page, social media and advertising

ODOT Hwy Maintenance district 1	Internet, web page, newspapers,	Word of mouth in local areas, local media outlets, local news publications
ODOT Maintenance 1 2C	State website	People that are looking for job security
ODOT region 1 2B	Advertising	Time off is a plus
ODOT Region 4 Dist.11	Face book newspaper radio	Facebook
ODOT, D-12	Radio, paper	Job fair
ODOT, Highway, D8	Full list of job duties and expectations of the job.	Fire & Ice CoOp, ODOT employing ODF employees outside of Fire Season.
ODOT/Hwy/12	Advertising	Social media
Oregon Department of Transportation; Highway/Maintenance/2C	Print media, internet	
Oregon Dept. of Transportation/Highway/High Cascade Area	Social Media, Newspapers, Job Fairs	Word of mouth
Oregon Dept. of Transportation	Advertising, word of mouth, internet state jobs page	Benefits package
Oregon DOT	Workday/social media	Social media outreach
Patton Township, Centre County, PA	Paper Ads, Online Ads, Ad in Tech Institute	Paper Ads, hiring first time employees and training them
Pierce County Planning and Public Works, Maintenance and Operations Division	Local advertising; job fairs; local recruitment resources, e.g. - work force, district court, local tribes	Advertising
Public Works Germantown, TN	Postings online	Word of mouth
Road Commission for Oakland County	Our HR department has been to job fairs and RCOC had a solid reputation. Some of the safest roads in the country per 100,000 miles driven.	Again RCOC's reputation.
Syracuse City Utah	Paper posting at all city buildings, City email, City website, City Facebook, State Department of Workforce Services. Other web services will find our posted jobs and list them (ie. Indeed.com)	Employee referrals, and part time staff seeking full time.
Town of Waterford, CT	Webpage, Newspaper, Internal posting	Word of mouth
Transportation	Internet job postings	
Unified Government/Street Division	Job fairs	Job fairs

Vermont Agency of Transportation	Job fairs, school visits	Visiting tech schools and offer paid internships
Vermont Agency of Transportation	Job fairs, social media	Social media
Village of Algonquin, IL DPW	Newspaper, local and national APWA	Word of mouth
Village of Bartlett / Streets	Newspaper, on-line advertisements	Word of mouth
Village Of New Lenox - Streets	Internet advertisement	Word of mouth
VTrans	Website	Websites
VTrans/Highway/Maintenance/District 4	Web, social media	Social media
WSDOT	Social Media, Career Fairs	
WV DOH	Hiring events	Hiring events
WV DOT	Benefits	No other jobs in the area
WV DOT Division of Highways	External job postings, job fairs when necessary	It varies depending on the overall economy of the areas. When mines close we pick up operators. When mines are operating we cannot hire suitable candidates due to noncompetitive pay.
WYDOT	All forms of media	Having temporary positions and then moving them to permanent when possible
WYDOT/D1	Recruitments through social media, advertisements and work of mouth	Word of mouth

An additional follow up question asked what respondents would like to do differently to attract good candidates (Table 43). When asked what they would like to do differently to attract good candidates for winter maintenance positions, better or more competitive pay was the most common answer. Some respondents mentioned expanding their outreach and others mentioned making the hiring process quicker. Once respondent specifically mentioned that the younger generation coming into the industry need more training.

Table 43. What would you do differently to attract good candidates?

Agency	What would you like to do differently to attract good candidates?
	Career Days, media
	Hire at a hire work classification to pay for experience (already a CDL driver, equipment etc.)

	Job fairs
	To pay more
Alaska DOT&PF Northern Region Highways & Aviation	Would like the ability to advance starting pay scale to be competitive.
AOT	Pay
AOT	Pay a better starting wage and advertise more
California Dept. of Transportation	Be able to offer a competitive wage
CalTrans District 09	More pay and benefits
City of Bozeman Streets	Raise base pay.
City of Charlottesville, VA	Increase wages
City of Crystal	More training needs to be done for the younger generation coming in.
City of Crystal Lake	Pay more
City of Farmington Hills, MI-DPW	Bring the pension back to new employees
City of Fishers, IN	Correct my pay scale
City of Fridley Public Works Department	Educate to Hire program
City of Kirtland	Growth and development
City of Littleton Public Works Streets Division	More Money
City of Oakdale Public Works	Work with union and administration to increase pay
City of St. Paul	More advertising but it takes more money.
Denver Department of Transportation and Infrastructure/Street Maintenance/Asset Management	Increase pay for line workers
Department of Transportation	Canvass technical high schools and get the word out. Additional out reach through web portals
District 1	You get what you pay for.
District 4 Hereford	Increase the pay scale
DOH	Quicker, simpler hiring process and time
Idaho trans dept	Higher wages,
Idaho Trans Dept	Increase wage, On call compensation.
Idaho Trans. Dept. District 2	Maybe go to schools and attempt to attract good students who also have good work ethic exhibited in sports etc.
Idaho Transportation Department	Job Fairs, Safety Fest
ITD	Change the pay scale
ITD D5	Pay better
ITD/district 4/Shoshone/Fairfield	Provide housing in rural areas
Kansas DOT	Offer a better starting salary
MaineDOT	Be able to hire them more quickly and have more flexibility with the pay range
MaineDOT	Be able to pay more money

MaineDOTRegin4	Up the pay
MDOT/SHA	make pay better
MEDOT Region 5	Not sure
MnDot/District 7	Offer competitive pay to attract some from the private sector
NDDOT/Dickinson	Better pay
Newport News Public Works	Recruit, increase salary
NHDOT-Highway Maintenance	Expand media outreach, radio, television
ODOT	N/A
ODOT Delivery and Operations D12	Quicker hiring process
ODOT Hwy Maintenance district 1	?
ODOT Maintenance 1 2C	Make the pay appealing
ODOT region 1 2B	More Money
ODOT Region 4 Dist.11	Shorten recruitment times
ODOT, D-12	Increase pay
ODOT, Highway, D8	Nothing
ODOT/Hwy/12	shorten the hiring process
Oregon Dept. of Transportation	Pay Increase
Oregon DOT	None
Patton Township, Centre County, PA	Understand better the market, work with community colleges/tech schools
Pierce County Planning and Public Works, Maintenance and Operations Division	Support and partner with vocational training institutions.
Public Works Germantown, TN	Reach into the technical schools
Road Commission for Oakland County	It would be good to get younger people interested in this line of work. Possible have HS teach the trades again.
Syracuse City Utah	Nothing
Town of Waterford, CT	Stay away from boring job description used for recruitment
Transportation	Pay more money
Unified Government/Street Division	More interaction with high schools/ trade schools.
Vermont Agency of Transportation	Offer higher starting salary
Vermont Agency of Transportation	Recruit from outside state
Village of Algonquin, IL DPW	Have a better competitive pay structure
Village of Bartlett / Streets	Experience requirements
Village Of New Lenox - Streets	Not sure
VTrans/Highway/Maintenance/District 4	Job fairs/newspaper ads
WSDOT	Offer more pay
WV DOH	Speed the process up
WVDOT	Make hiring process quicker

WVDOT Division of Highways	Nothing since we began hiring Equipment Operator 1 positions and then providing training and requiring them to get CDL within first 6 months of employment.
WYDOT	Have a competitive pay plan
WYDOT/D1	Pay more

Employee Retention

Respondents were asked how much difficulty their agency has in retaining roadway maintenance workers (Figure 20, Table 44). Most respondents (63.8%) felt that they had some difficulty retaining workers and 18.1% of respondents felt that they had a significant amount of difficulty retaining workers.

Table 44. Level of Difficulty Retaining Employees

Difficulty Retaining Employees	Total Respondents	Percentage of Total Respondents (N=94)
None	17	18.1%
Some	60	63.8%
Significant Amount	17	18.1%

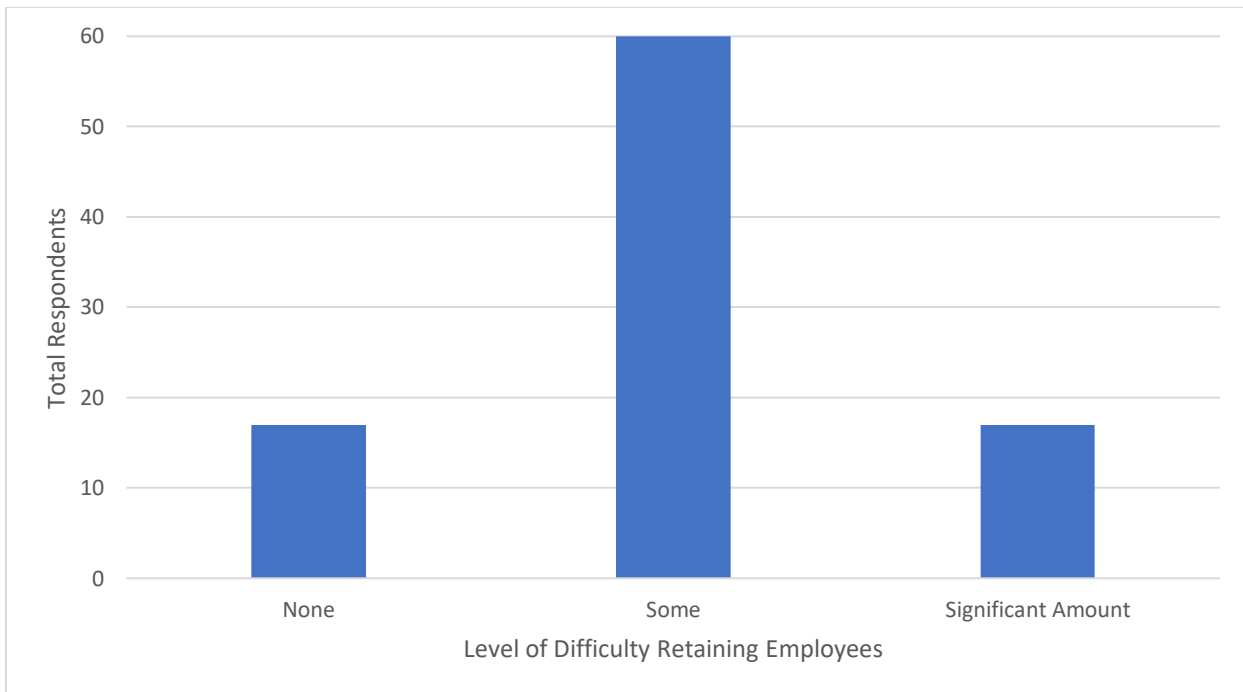


Figure 20. Level of Difficulty Retaining Employees

Exit Interviews

Exit interviews can provide valuable information on why employees leave and agency. Respondents were asked if their agency conducted exit interviews. Most respondents (73.1%) stated that they conducted exit interviews (Figure 21). A follow up question asked these respondents who conducted the

exit interview (Table 45). Most stated that their exit interviews were conducted by a human resources employee or by the employee’s direct supervisor. Some stated that their exit interviews were done via a self-written form or online. A final follow up question asked respondents what questions from their exit interview that they found to be most helpful or insightful (Table 46). Respondents stated that questions like “Why are you leaving?” or “Would you recommend employment here?” were insightful. Additional questions related to things that the agency could do better as an employer and questions related to their manager/supervisor were also found to be insightful.

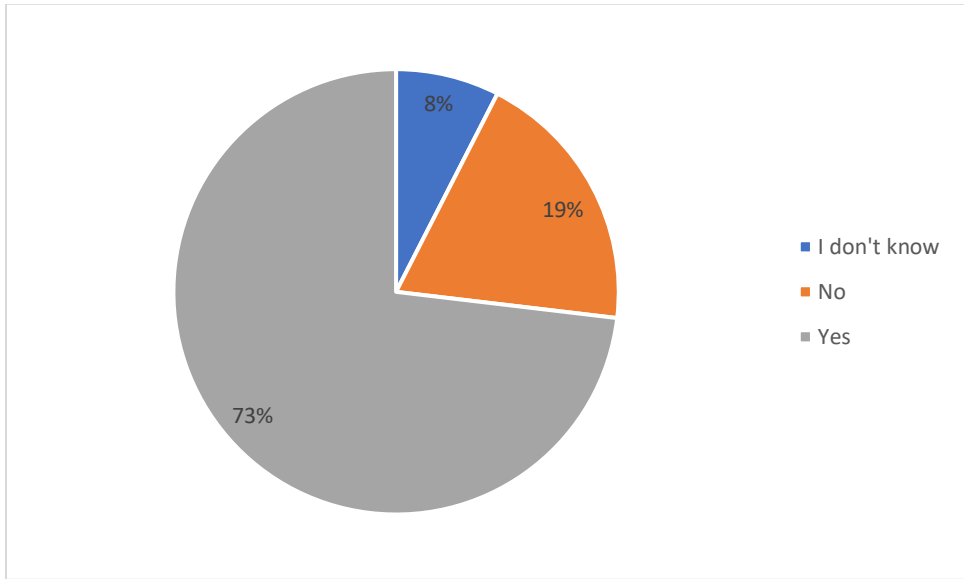


Figure 21. Does your agency conduct exit interviews?

Table 45. Who conducts your exit interviews?

Agency	Who conducts the exit interview? (manager, supervisor, HR, etc.)
	Manager
	Manager
	HR NEED TO LISTING WHAT SAID
	Manager
	Manager
	Manager
Alaska DOT&PF Northern Region Highways & Aviation	Online.
AOT	Both
CalTrans District 09	Supervisor
City of Bozeman Streets	HR
City of Charlottesville, VA	Department HR Representative
City of Crystal	HR
City of Fairway, KS Public Works Dept	PW Director
City of Farmington Hills, MI-DPW	Managers, HR

City of Fishers, IN	HR
City of Fridley Public Works Department	HR
City of Kirtland	Director, HR
City of Littleton Public Works Streets Division	HR
City of St. Paul	Supervisor or HR
Denver Department of Transportation and Infrastructure/Street Maintenance/Asset Management	HR
Department of Transportation	Manager or supervisor
DISTRICT 1	Supervisor
Highway/Maintenance/ District 4	Manager
Idaho Trans Dept	HR VIA Email
Idaho Trans. Dept. District 2	HR
Idaho Transportation Department District 3	HR
ITD	HR
ITD	HR
ITD D5	HR
ITD/district 4/Shoshone/Fairfield	HR- Supervisor
Kansas DOT	HR it is done online
MaineDOT	Sometimes HR, sometimes the supervisor, sometimes they fill out a form, often they just leave without doing any of it
MaineDOTRegin4	HR
Mass DOT D3B	Supervisor
MDOT/SHA	HR
MEDOT Region 5	HR
MnDot/District 7	HR
NDDOT/Dickinson	HR
Newport News Public Works	Street Maintenance Administrator or Assistant Administrator
NHDOT-Highway Maintenance	HR, but only done on occasion and not all exits. # of employees leave with no notice
ODOT	Manager
ODOT Delivery and Operations D12	Manager
ODOT Hwy Maintenance district 1	Managers, HR
ODOT Region 2	Manger
ODOT Region 3, District 7, Highway	Manager or District Manager
ODOT, D-12	Manager
ODOT/Hwy/12	Manager

Oregon Department of Transportation; Highway/Maintenance/2C	HR
Oregon Dept. of Transportation	HR
Oregon DOT	Manager
Public Works Germantown, TN	HR
Road Commission for Oakland County	HR
Syracuse City Utah	City Manager
Transportation	HR
Vermont Agency of Transportation	HR
Vermont Agency of Transportation	General Manager, Operations
Village of Algonquin, IL DPW	HR
Village Of New Lenox - Streets	HR
VTrans	Manager
WSDOT	HR
WVDOT	Supervisor
WVDOT Division of Highways	The employees direct-report supervisor.
WYDOT	HR
WYDOT Dist 3 Southwest AMS	Manager, HR representative
WYDOT/D1	Self-written form

Table 46. Insightful Exit Interview Questions

Agency	Which questions from your exit interview have you found to be most helpful/insightful?
	TELL US WHAT COULD BE CHANCE TO MAKE THING BETTER
	Why are you leaving
	Why did you choose to leave the Agency
	why they are leaving, would you recommend employment here
Alaska DOT&PF Northern Region Highways & Aviation	Reason for leaving. Mostly pay related
AOT	Not real sure
CalTrans District 09	Why are you leaving? Was it due to? Job duties, supervisor or crew, salary and Benefit package, and retirement percentage?
City of Bozeman Streets	Don't know. If I did know, I don't place any importance on exit interviews. They're quitters.
City of Crystal	NA
City of Fairway, KS Public Works Dept	What would you like to see be done differently
City of Farmington Hills, MI-DPW	What can we do better as an employer??

City of Fishers, IN	Not involved in the process
City of Fridley Public Works Department	What factors induced your departure?
City of St. Paul	Why they are leaving
Department of Transportation	What are the main reasons for your leaving? What things would you have liked to see changed?
DISTRICT 1	Reason for leaving and what could we have done to make it more enjoyable working here
Idaho Trans Dept	What would keep you here?
Idaho Trans. Dept. District 2	I never see them
Idaho Transportation Department District 3	Do not know
ITD	Don't know
ITD D5	Why are you leaving the department
ITD/district 4/Shoshone/Fairfield	Pay
Kansas DOT	What are your reasons for leaving
MaineDOT	Why are you leaving?
MaineDOTRegin4	N/A
MDOT/SHA	N/A
MEDOT Region 5	What is the reason for leaving?
MnDot/District 7	Why are you leaving MnDot?
NDDOT/Dickinson	HR handles this. I don't see them
Newport News Public Works	The entire exit interview is helpful.
NHDOT-Highway Maintenance	Unknown, unfamiliar with what is actually asked
ODOT	How did you like your job
ODOT Hwy Maintenance district 1	?
ODOT Region 3, District 7, Highway	Main reason for leaving
ODOT/Hwy/12	all
Oregon Department of Transportation; Highway/Maintenance/2C	N/A
Oregon Dept. of Transportation	Don't know
Oregon DOT	What worked and what did not work
Public Works Germantown, TN	Not known
Road Commission for Oakland County	Not sure. I do not get information regarding exit interviews.
Syracuse City Utah	What would you like to see different or changed in the department?
Transportation	Why are you leaving
Vermont Agency of Transportation	Information not shared
Vermont Agency of Transportation	What triggered your looking elsewhere
Village of Algonquin, IL DPW	How was your department leadership?
Village Of New Lenox - Streets	Not given access to information

WSDOT	N/A
WVDOT	Reason for leaving
WVDOT Division of Highways	Why are you leaving?
WYDOT/D1	Not sure

Reasons Why Workers Leave

Respondents were asked to consider the reasons why their employees were leaving beyond retirement, 89 respondents provided information on why their employees were leaving their agency (Figure 22, Table 47). The most common reason employees were leaving was due to competition from the private sector for similar jobs (70.8% of respondents). Respondents also struggled with workers leaving due to a career changes both outside the organization (53.9% of respondents) and within the organization (44.9% of respondents). Five respondents responded with “Other” and stated issues with low pay, retirement, and failed drug tests (Table 48).

Table 47. Reasons Why Workers Leave

Reason Why Workers Leave	Total Respondents	Percentage of Total Respondents (N=89)
Don't Know	6	6.7%
Career change (outside of organization)	48	53.9%
Job Change (within organization)	40	44.9%
Competition from private sector for similar jobs/work	63	70.8%
Competition from public sector for similar jobs/work	35	39.3%
Relocation	23	25.8%
Health and/or family issues	12	13.5%
Dissatisfaction/job stress	25	28.1%
Workplace culture/leadership issues	9	10.1%
Lack of professional development/training	5	5.6%
Lack of opportunities for promotion/career progression/advancement	17	19.1%
Compensation/benefits	36	40.4%
Termination for poor performance/accidents/traffic violations, etc.	15	16.9%
Failure to maintain CDL/DOT	14	15.7%
Other	5	5.6%

Table 48. Other Reasons for Employees Leaving

Agency	Other Text
	WisDOT does not employ drivers, we only have a small management team
City of Bozeman Streets	Low pay.
City of Crystal	NA
Newport News Public Works	Failed drug testing.
Syracuse City Utah	Retirement

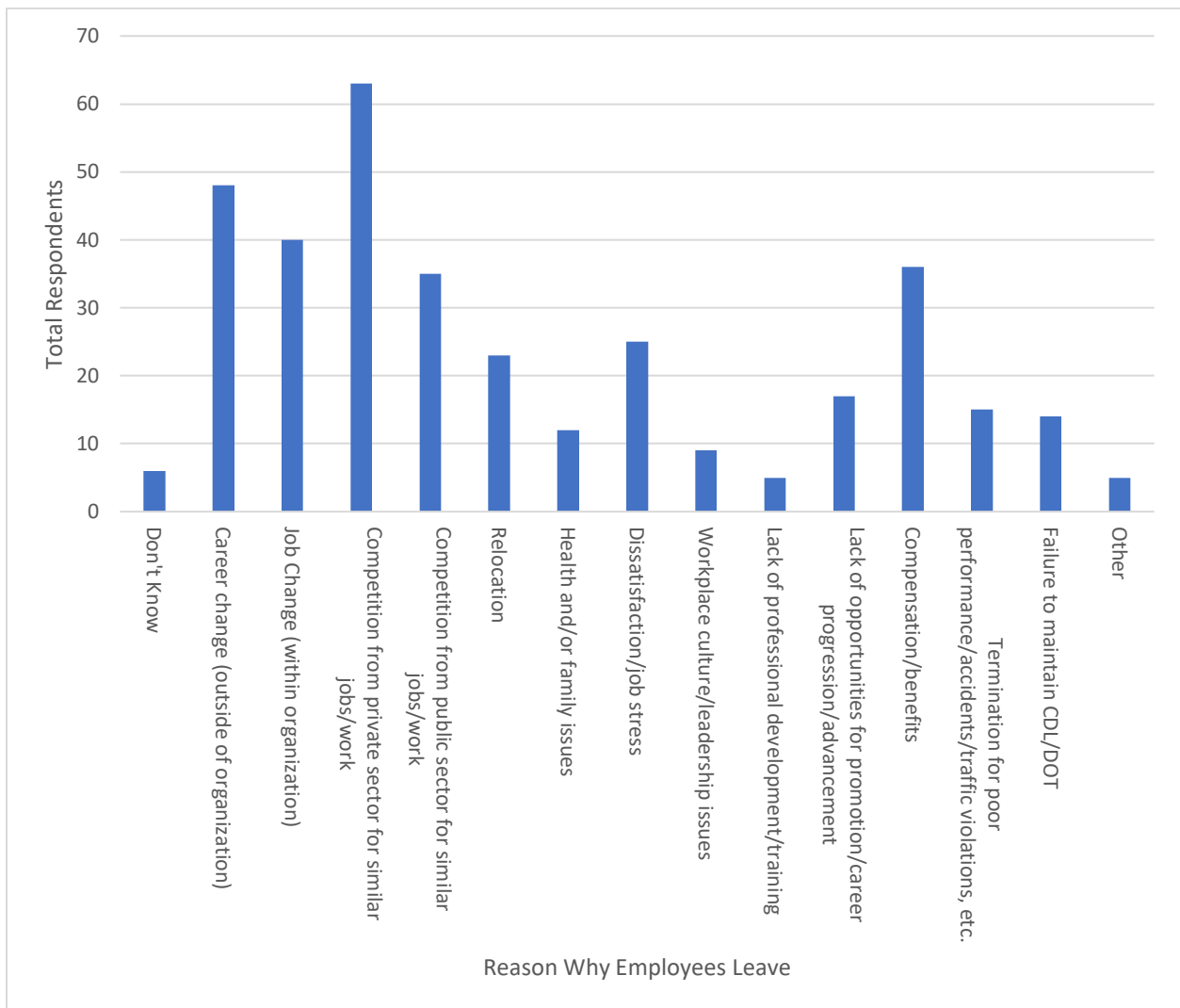


Figure 22. Reasons Why Workers Leave

Retention Strategies

Respondents were asked to provide information on which retention strategies they utilized at their agency, 82 respondents provided information on their retention methods (Figure 23, Table 49). Most respondents (78%) used employee recognition and/or service year awards. Many respondents (63.4%)

were using cross-training or job enhancement programs. A Few respondents noted using retention bonuses or contracts to stay a length of time after receiving training. Ten respondents stated that they were using other methods to retain employees and listed methods like merit pay, snowplow bonuses, and horizontal career pathways (Table 50).

Table 49. Retention Strategies Used

Retention Strategy Used	Total Respondents	Percentage of Total Respondents (N=82)
Employee Recognition and/or service year awards	64	78.0%
Merit-based pay raises	29	35.4%
Retention bonuses	4	4.9%
Education/tuition reimbursement (for GED, AA, BA/BS)	32	39.0%
Certificate/Certification courses offered by recognized organizations (LTAPs, APWA, IMSA)	32	39.0%
Cross-training/job enhancement	52	63.4%
Attendance at regional/national conferences (APWA, IMSA)	17	20.7%
Mentor/mentee programs	25	30.5%
Promotions/succession planning/career ladders	39	47.6%
Contract to stay a certain length of time after receiving training, such as CDL training	4	4.9%
Other	10	12.2%

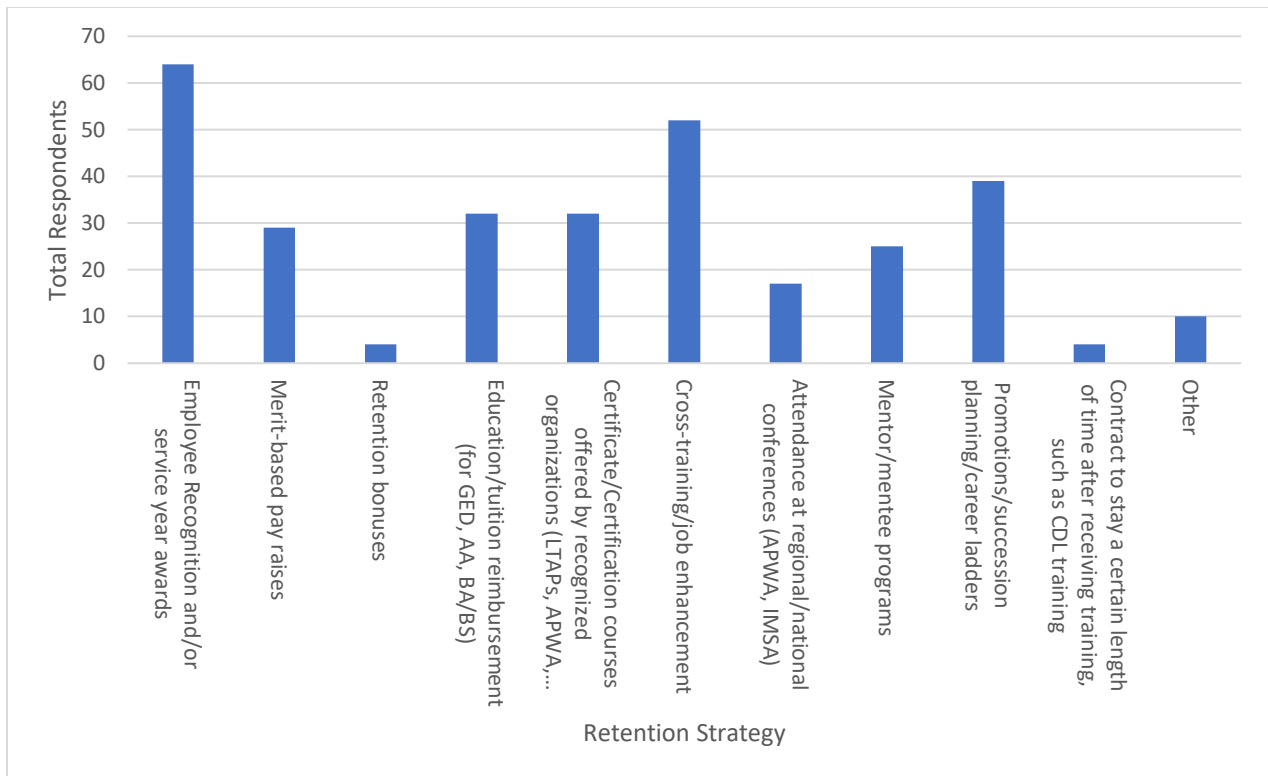


Figure 23. Retention Strategies Used

Table 50. Other Retention Strategies Used

Agency	Other Retention Methods
	WisDOT does not employ drivers, we only have a small management team
City of Bozeman Streets	None.
City of Crystal Lake	Merit pay
City of Fridley Public Works Department	Flexible working hours/duties
ITD	Horizontal career path
Kansas DOT	Most of these don't apply to maintenance workers
MaineDOT	Longevity pay, stipends
Oregon Dept. of Transportation/Highway/High Cascade Area	None
Syracuse City Utah	Benchmark wage scale (market review with comparative cities) every four years. If scale increases, employees' wages increase to remain as situated in the scale (to prevent staying at the new minimum).
Transportation	Snowplow bonus

A follow up question asked respondents which retention strategy they found to be most effective or successful in their agency, 61 respondents provided information on their most effective strategy (Table

51). Respondents listed a number of successful retention strategies ranging from pay and benefits programs, career pathways/ladders, and training programs.

Table 51. Most Successful Retention Strategy

Agency	What are the most effective/successful retention strategies used in your agency?
	EMPLOYEES MUST BE ABLE TO PAY THIER MONTHLY BILLS FOOD / HOUSE DAY CARE
	N/A
	Promotions, succession planning
	Retirement
Alaska DOT&PF Northern Region Highways & Aviation	Provide the best working conditions we possibly can. Generous leave package.
AOT	A lot of what they have they don't use or are so difficult to obtain or are not used or are used and then fall by the wayside with the constant turnover of upper management
California Dept. of Transportation	Steady pay despite the economy
City of Bozeman Streets	Treat employees well. Have fun.
City of Charlottesville, VA	Career ladders
City of Crystal	NA
City of Crystal Lake	Pay
City of Farmington Hills, MI-DPW	Treat people with respect.
City of Fishers, IN	Build trusting relationships
City of Fridley Public Works Department	Flexible working hours/duties
City of Kirtland	Cross training. helps keep the team engaged
City of Littleton Public Works Streets Division	Family benefits vacation time
City of Oakdale Public Works	Recognition of accomplishments, good training, occasional lunches
City of St. Paul	Make sure that we are progressing with BMPs throughout all of our maintenance activities. Newer and more efficient equipment.
Department of Transportation	Job stability
District 1	Benefits and Pensions
DISTRICT 1	Money
DOH	The benefits
Idaho trans dept	Horizontal career paths
Idaho Trans. Dept. District 2	The benefits seem to be the greatest retention.
Idaho Transportation Department District 3	Do not know
ITD D5	Good Benefits
ITD/district 4/Shoshone/Fairfield	Career path -benefits
Kansas DOT	Don't have one
MaineDOT	Pay stipend, snow fighter bonus

MaineDOT	Promotional opportunities and job training
MaineDOTRegin4	Merit pay with training
MEDOT Region 5	Giving them the opportunity for advancement which in turn leads to higher wages.
MnDot/District 7	We really can't offer any incentive aside from what is negotiated in the union contract. We do promote the usage of vacation and comp time
NDDOT/Dickinson	Unknown. HR handles this
Newport News Public Works	Pay raises
NHDOT-Highway Maintenance	Looks like we don't do much
ODOT	Succession
ODOT region 1 2B	NA
ODOT Region 3, District 7, Highway	Steady job, no lay offs
ODOT Region 4 Dist.11	Pay, retirement
ODOT, Highway, D8	Offer whatever is needed to promote within. Success and drive falls on the employee.
Oregon Dept. of Transportation/Highway/High Cascade Area	None
Oregon Dept. of Transportation	Training
Oregon DOT	Opportunity for rotation and advancement/Benefits
Patton Township, Centre County, PA	Retirement benefit 5 year vestiture for Township match of 2x employee contribution
Pierce County Planning and Public Works, Maintenance and Operations Division	Career development opportunities, cross training, recognition
Public Works Germantown, TN	Mentoring and rapid promotions
Road Commission for Oakland County	I would say overall pay and benefits.
Syracuse City Utah	Career progression (advancements and promotions).
Transportation	Snow plow bonus
Vermont Agency of Transportation	Minor monetary recognition. Unable to offer any longer
Vermont Agency of Transportation	State pension and benefits
Village of Algonquin, IL DPW	Cross training
Village of Bartlett / Streets	longevity pay
Village Of New Lenox - Streets	Not sure
VTrans	Raises
VTrans/Highway/Maintenance/District 4	Cross training/mentor-mentee
WVDOT	Training
WVDOT Division of Highways	Standardized promotion/career advancement structure based on training and experience criteria.
WYDOT Dist 3 Southwest AMS	Benefits, retirement package

WYDOT/D1	None
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Respondents were asked what they would like to do differently to retain good workers, 70 respondents provided information on changes they would like to see in their agency (Table 52). Improving pay and benefits as well as regular promotions were the most commonly mentioned by respondents. Many respondents wanted to be able to give bonuses, merit, or recognition-based pay. One respondent mentioned that they will be implementing a career development plan soon, and another mentioned the need for a step program.

Table 52. What would you like to do differently to retain good workers?

Agency	What would you like to do differently to retain good workers?
	Bonus, Higher pay for achievers
	Merit Pay
	N/A
	PAY MORE THEN \$14.00 A HOUR YOU CAN NOT LIVE ON THAT
	Reward good workers
	Stop chipping away at benefits and raises
Alaska DOT&PF Northern Region Highways & Aviation	Start the good employees at a wage they can accept. Work/ home life balance
AOT	Better pay
AOT	Pay a better starting wage and stream line the promotion process to bring people that start in a lower rank to be able to move up
California Dept. of Transportation	Offer better long-term benefit/retirement package
CalTrans District 09	More pay
City of Bozeman Streets	Raise base pay.
City of Charlottesville, VA	Increase budget for wages
City of Crystal	NA
City of Farmington Hills, MI-DPW	Offer the old pension programs and lower health care.
City of Fishers, IN	Correct my pay scale
City of Fridley Public Works Department	Ensure base pay is competitive with competing agencies.
City of Kirtland	Expand opportunities for growth.
City of Littleton Public Works Streets Division	Offer more Money
City of Oakdale Public Works	Increase pay and benefits to more closely match the private sector
City of St. Paul	Have a merit based step system to pay. Years of service doesn't mean anything. Reduce number of labor unions as their is too much unnecessary conflict.
Department of Transportation	Merritt based promotions

District 1	Raises
DOH	Pay by what they do
Idaho Trans Dept	More accountability for employees.
Idaho trans dept	Pay better, bonuses, recognition
Idaho Transportation Department	Better Promotions
ITD	More money
ITD	Pay more money
ITD D5	Pay better wages
ITD/district 4/Shoshone/Fairfield	Housing in rural areas
MaineDOT	Find ways to better recognize and reward them
MaineDOT	The ability to pay more money.
MaineDOTRegin4	Pay bye completion of training classes
Mass DOT D3B	Just hire
MDOT/SHA	Pay them more and promote
MnDot/District 7	Performance based bonuses or step increases
NDDOT/Dickinson	Better pay and facilities
Nevada DOT/District II	Until our pay is competitive with the market, we will continue to be a training ground
Newport News Public Works	Contract for CDL holders to stay; increase salary ranges
NHDOT-Highway Maintenance	Reward good performance and be able to swiftly correct poor performance. State contracts and Union are the two blockers.
ODOT	N/A
ODOT Delivery and Operations D12	Dismiss the poor performing employees
ODOT Hwy Maintenance district 1	Higher salary's
ODOT Maintenance 1 2C	Pay increase
ODOT region 1 2B	NA
ODOT Region 4 Dist.11	CDL THC drug test
ODOT, D-12	Better pay
ODOT, Highway, D8	Get more money to hire/increase crew size
ODOT/Hwy/12	Increase pay scale
Oregon Dept. of Transportation	Merit Based Pay Raises
Oregon DOT	I think that we do a good job at retaining employees
Patton Township, Centre County, PA	Diversify based on increased knowledge and responsibilities: traffic signals, pesticide applicators,
Pierce County Planning and Public Works, Maintenance and Operations Division	Develop a performance based bonus pay strategy
Public Works Germantown, TN	We need a step program
Road Commission for Oakland County	Perhaps give a bonus for good workers.
Syracuse City Utah	I'm always open to ideas. So far, things are good.

Transportation	Pay more money
Unified Government/Street Division	Will be implementing Career Development Plan soon
Vermont Agency of Transportation	Improve pay scale
Village of Algonquin, IL DPW	Have better opportunity to move up in the organization, but tenure is too stable
Village of Bartlett / Streets	Better pay based on merit
Village Of New Lenox - Streets	Hire more
VTrans	Higher pay
VTrans/Highway/Maintenance/District 4	Reasonable/predictable winter shifts, more recognition for the maintenance workers who sacrifice so much during the winter
WSDOT	Offer more money
WV DOT	Let employees train on more equipment
WV DOT Division of Highways	Nothing, overall we have a good benefit/training package for transportation workers.
WYDOT Dist 3 Southwest AMS	Regular pay adjustments
WYDOT/D1	More pay

CDL

Respondents were asked if their agency provided training for new hires to obtain a CDL and/or upgrade a CDL, 95 respondents provided information on their CDL policies. Most respondents (92.6%) provide training for new hires to obtain and/or upgrade a CDL (Figure 24).

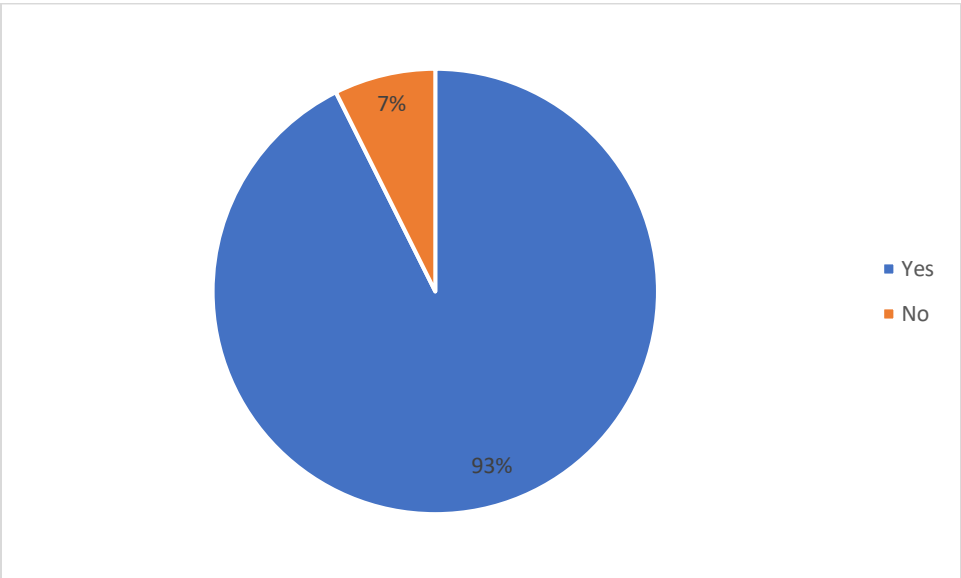


Figure 24. Does your agency provide training for new hires to obtain a CDL and/or upgrade a CDL?

Respondents were also asked if their agency paid for CDL renewals. Just over half of the respondents (52.9%) stated that their agency did provide funding for CDL Renewals (Figure 25).

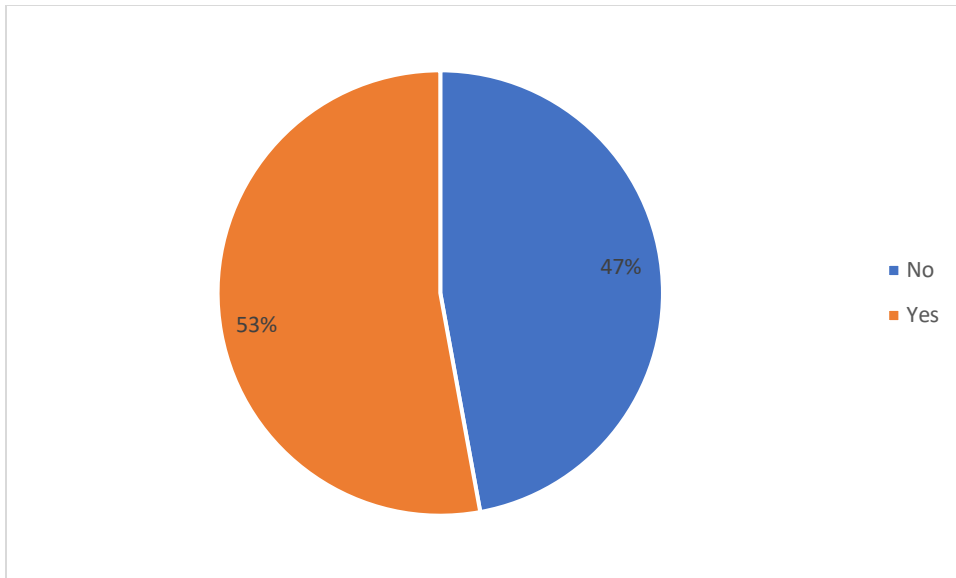


Figure 25. Does your agency pay for CDL renewal?

Additional Information Related to Recruitment and Retention

The final question asked respondents to provide any other information related to recruitment and retention of employees that had not been previously mentioned in this survey, 14 respondents provided additional information (Table 53). Respondents noted a number of other recruitment and retention efforts including; offering employees clothing, boot, and eye care allowances, reclassifying job codes to create a step system for hiring and promotions, equipment training with outside organizations, snow fighter bonuses, wellness coaching, and yearly employee recognition efforts.

Table 53. Additional Information Related to Recruitment and Retention Efforts

Agency	Does your agency do anything else related to recruitment and retention of employees that has not been previously mentioned in this survey that you feel would be of interest?
AOT	Unknown
CalTrans District 09	Knowledge transfer
City of Charlottesville, VA	Work with local CDL training program
City of St. Paul	Yearly employee appreciation luncheon, safety awards, retirements parties
District 1	Reclassification of job codes to make use of a step system in hiring and promotions
ITD D5	They do outside equipment training

MaineDOT	We do a \$100 a week bonus for the 20 week season that we have on the books for the winter season for being on call.
MaineDOT	We offer a snow fighter bonus, wellness coaching, seasonal readiness, gym/health club reimbursement
Mass DOT D3B	Just hire
NHDOT-Highway Maintenance	Large signs at the individual patrol sheds because our workers are local to the area so those are the folks that need to be solicited.
Oregon Dept. of Transportation	Don't Know
Syracuse City Utah	In 2016, our city council adopted a recruitment, retention, and compensation policy that we follow.
Village of Algonquin, IL DPW	Provides some autonomy in decision making
WYDOT/D1	Clothing, boot and eye [care] allowance

Winter Maintenance Worker Survey

A total of 41 winter maintenance workers responded to this survey.

Respondent Information

Most respondents (92.7%) were from a State DOT at the District level (Table 54). The remaining were from a Municipal Agency or Other. The one respondent who indicated “Other” stated that they worked for I-81.

Table 54. Agency Type

Agency Type	Total Respondents	Percentage of Total Respondents
Municipal	2	4.9%
County	0	0.0%
State DOT District	38	92.7%
Other	1	2.4%

Respondents covered a variety of job titles, common job titles included apprentice, maintenance worker, journeyman worker, master worker, and transportation worker (Table 55).

Table 55. Respondent Job Title

Job Title
Apprentice
Apprentice Maintenance Worker
Area Maintenance Supervisor
BMW IV regional supervisor
Bridge maintenance worker

District maintenance worker
Equipment specialist
Equipment specialist
Journeyman
Journeyman
Journeyman Maintenance Worker
Journeyman maintenance worker
Master maintenance worker
MASTER MAINTENANCE WORKER
Master maintenance worker
Master maintenance worker
Master maintenance worker (MMW)
Operation supervisor
Road maintenance worker
Senior maintenance worker
Supervisor
Supervisor
Systems Analyst
TAMS
Technician
Technician
Transportation Area Maintenance Supervisor
Transportation area supervisor h
Transportation Generalist
transportation generalist
Transportation master maintenance worker
Transportation worker
Transportation Worker
Transportation worker 1
Transportation Worker 3 Mechanic
Transportation Worker I
TRCRSV2
TW-1
TW2

Coverage Area

Respondents were asked to describe whether their coverage area was rural, urban, or a combination of both (Figure 26, Table 56). A total of 42 respondents provided information on their coverage area. Most respondents (61.9%) had a coverage area that was a combination of both rural and urban. Only 11.9% of respondents worked in an urban coverage area.

Table 56. Coverage Area

Coverage Area	Total Respondents	Percentage of Total Respondents (N=42)
Rural	11	26.2%
Urban	5	11.9%
Combination Rural and Urban	26	61.9%

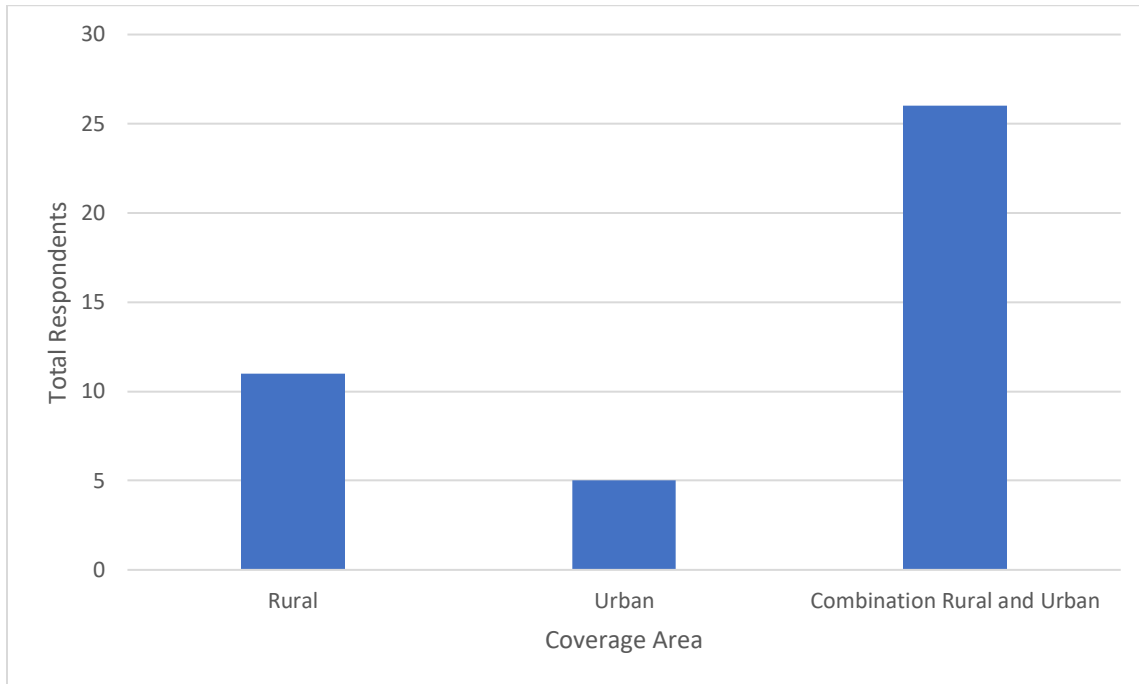


Figure 26. Coverage Area

Age

Respondents were asked to provide information on their age (Figure 27, Table 57). There was a good variability of respondent age groups. The most common age group was 48-55 years old (31.0% of respondents), followed by 41-47 years old and 56-62 years old (23.8%). No respondents were in both the youngest and oldest age groups (18-24 years old and 68 years and older).

Table 57. Respondent Age

Age	Total Respondents	Percentage of Total Respondents (N=42)
18-24	0	0.0%
25-32	5	11.9%
33-40	3	7.1%
41-47	10	23.8%
48-55	13	31.0%
56-62	10	23.8%
63-68	1	2.4%
68+	0	0.0%

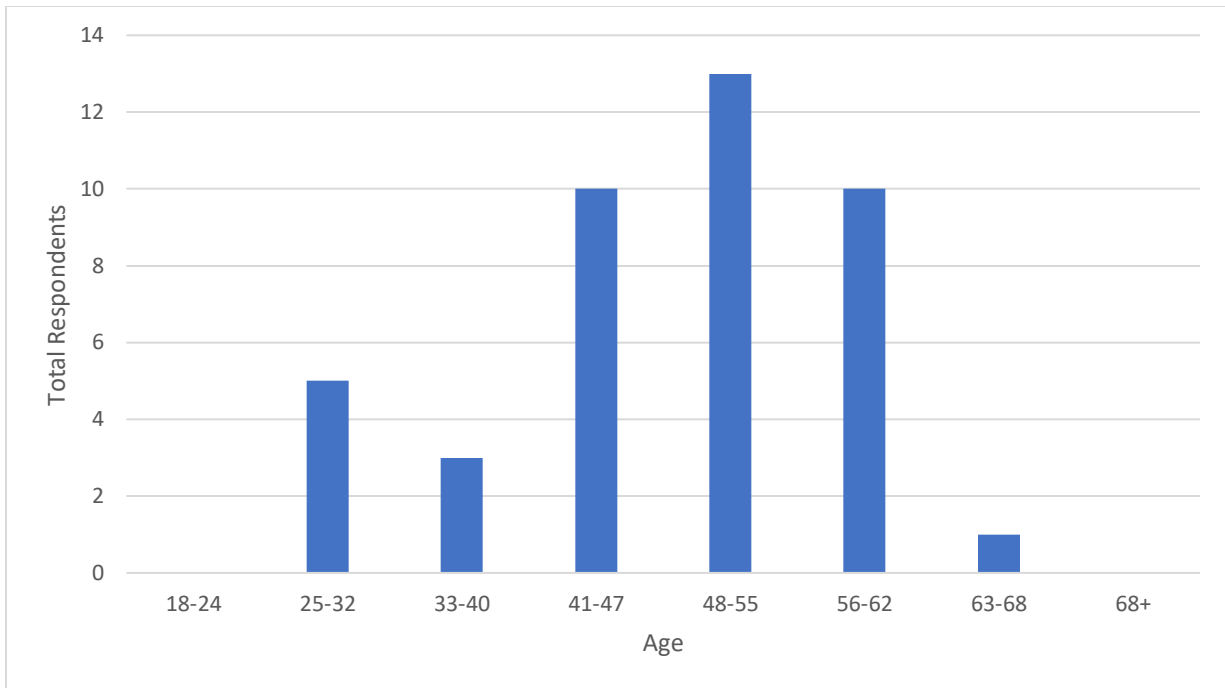


Figure 27. Respondent Age

Gender

Most respondents were male (95.2%) (Figure 28).

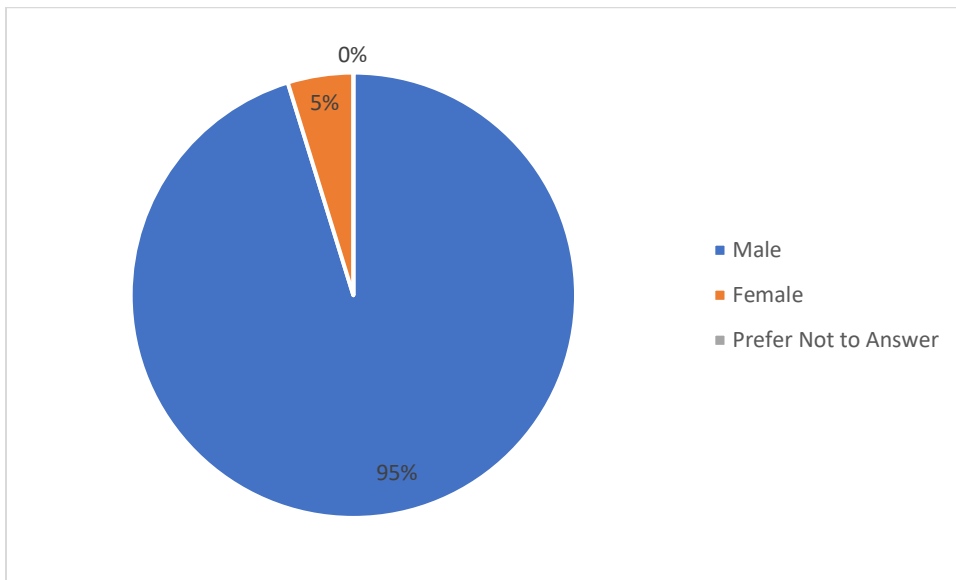


Figure 28. Respondent Gender

Race/Ethnicity

Most respondents were white (88.1%) (Table 58).

Table 58. Respondent Race/Ethnicity

Race/Ethnicity	Total Respondents	Percentage of Total Respondents (N=42)
Hispanic or Latino	0	0.0%
American Indian or Alaska Native	0	0.0%
Asian	0	0.0%
Black or African American	0	0.0%
Native Hawaiian or Other Pacific Islander	0	0.0%
White	37	88.1%
Some Other Race	0	0.0%
Prefer Not to Answer	5	11.9%

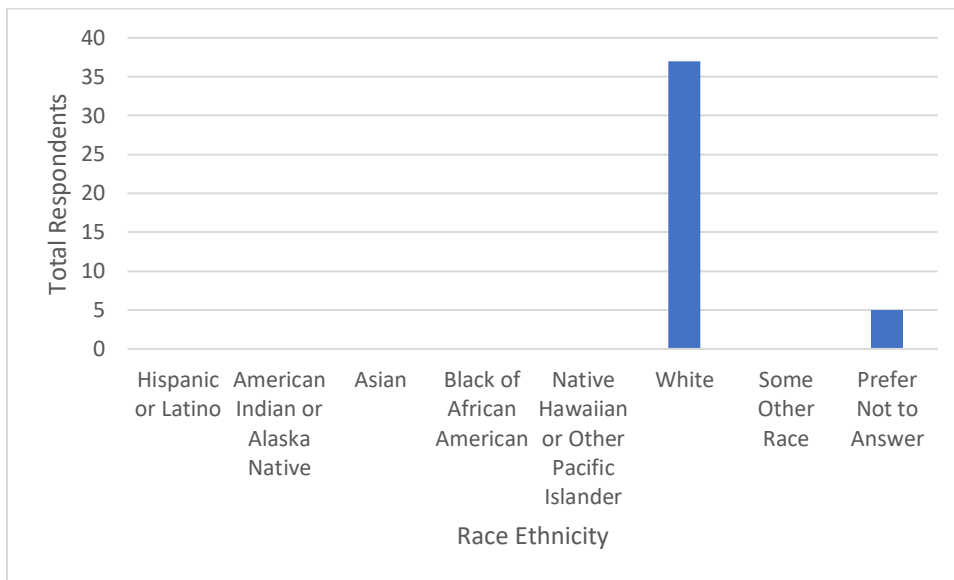


Figure 29. Respondent Race/Ethnicity

Education

Respondents were asked to provide information on their education (Figure 30, Table 59). More than half of respondents (52.4%) were high school graduates. Around 14% of respondents had received post-secondary education (either an Associate’s Degree (AA) or a Bachelor’s Degree (BA/BS)). Around 14% of respondents had military specialty school training, and 9.5% had completed trade school.

Table 59. Respondent Education

Education	Total Respondents	Percentage of Total Respondents (N=42)
Non-High School Graduate	3	7.1%
High School Graduate	22	52.4%
Some College	14	33.3%
Community College Certificate	0	0.0%

Associate's Degree	3	7.1%
Bachelor's Degree	3	7.1%
Union Apprenticeship	0	0.0%
Trade School	4	9.5%
Military Specialty School	6	14.3%
Professional Certification	0	0.0%
Other	0	0.0%

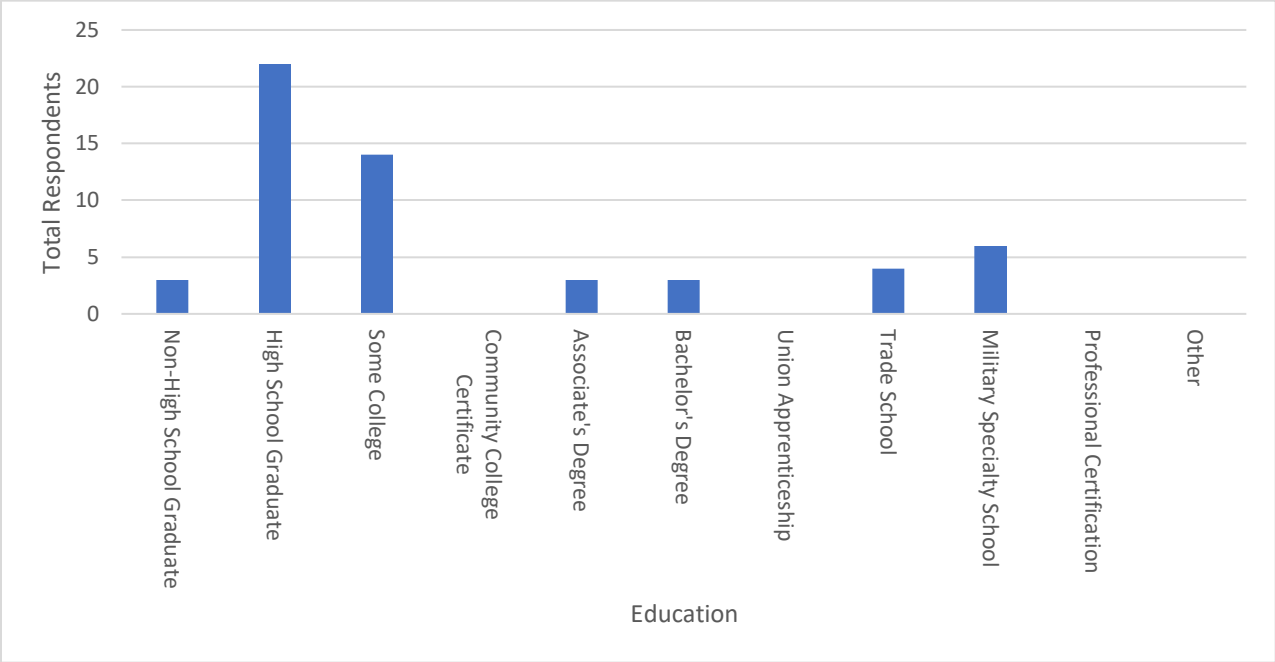


Figure 30. Respondent Education

CDL

Respondents were asked whether they had a commercial driver’s license (CDL), 42 respondents provided information. Most respondents (95.2%) had a CDL (Figure 31). A follow up question asked those that had a CDL what class of CDL they currently had, 39 respondents provided information on their CDL class (Figure 32, Table 60). Most respondents (82.1%) had a Class A CDL. The remaining respondents had a Class B CDL. One respondent had both a Class A and Class B CDL.

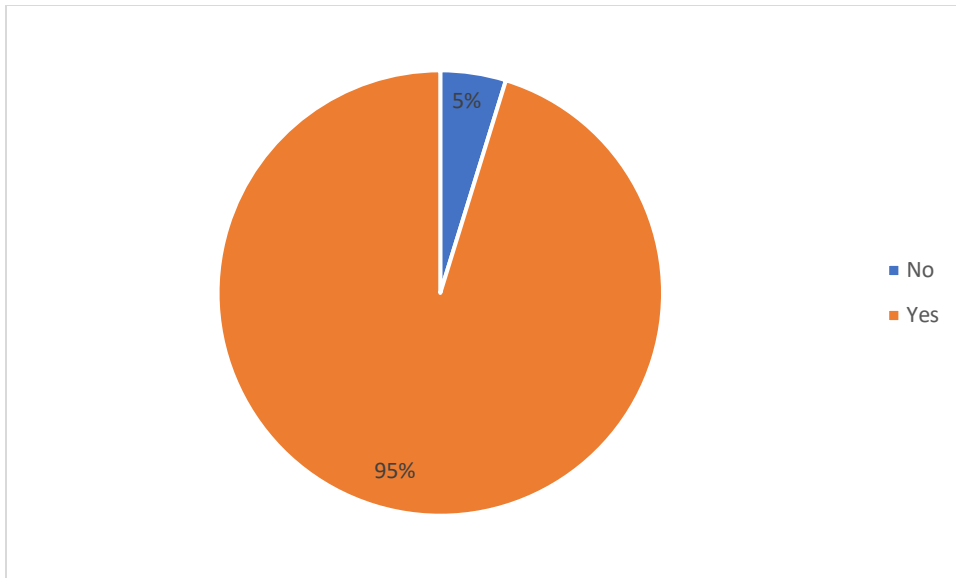


Figure 31. Do you have a commercial driver's license?

Table 60. What class of CDL do you have?

What class of CDL do you have?	Total Respondents	Percentage of Total Respondents (N=39)
Class A	32	82.1%
Class B	8	20.5%
Class C	0	0.0%

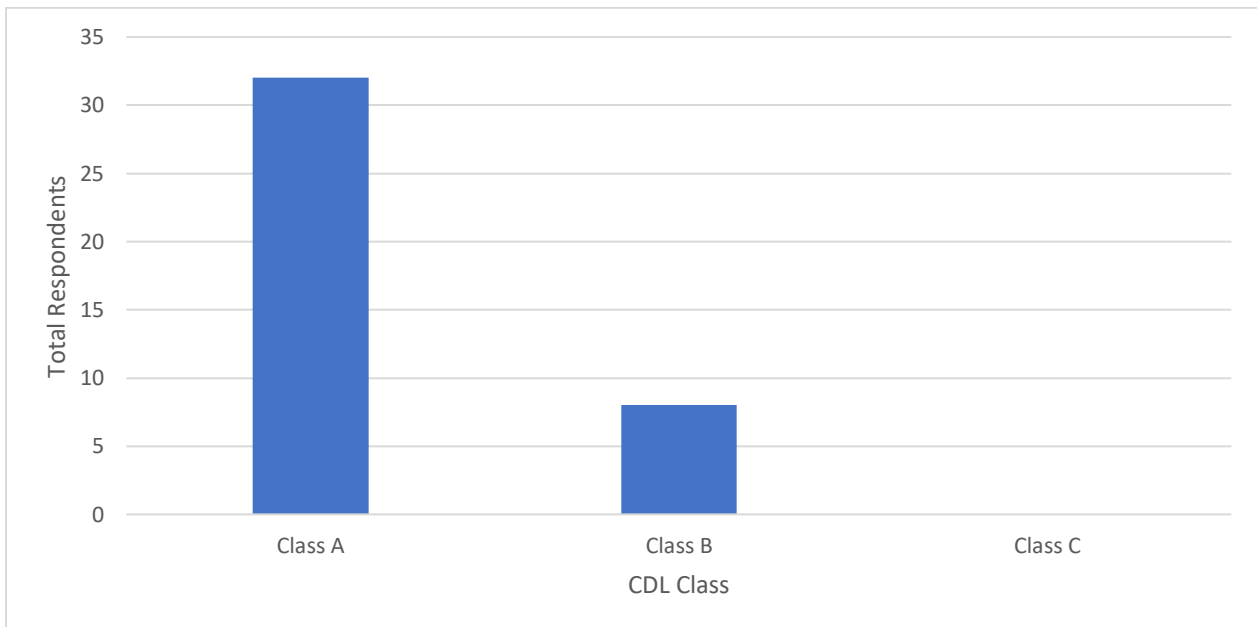


Figure 32. What class of CDL do you have?

An additional follow up question asked respondents whether they had obtained their CDL prior to their current employment or on-the-job, 39 respondents provided information on when they obtained their CDL (Figure 33). Most respondents (61.5%) had received their CDL prior to their current employment.

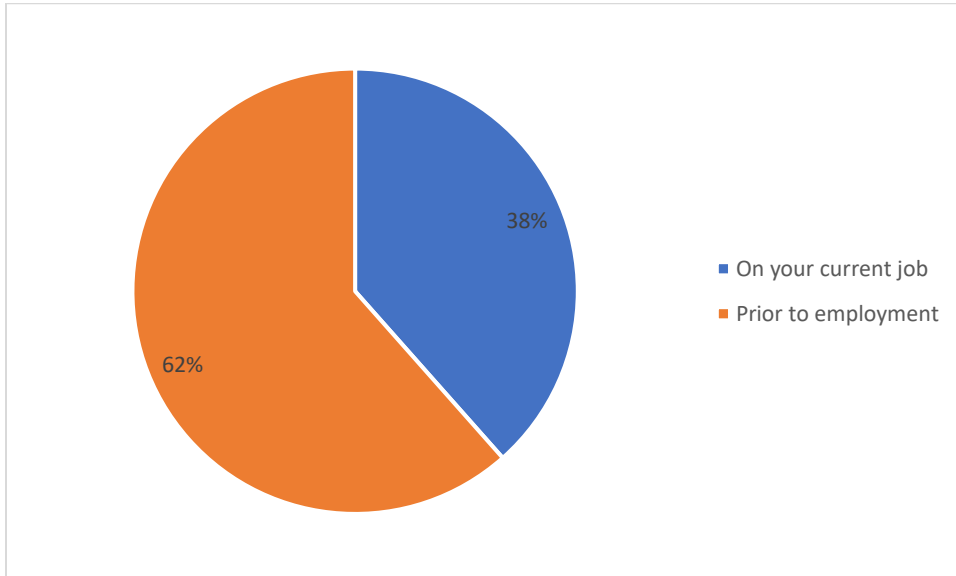


Figure 33. When did you obtain your CDL?

Military or Volunteer Program Service

Respondents were asked if they had served in the military or a volunteer program that granted Federal hiring preference, 41 respondents provided information (Figure 34). Most respondents (80%) did not have Federal hiring preference due to service in the military or volunteer programs.

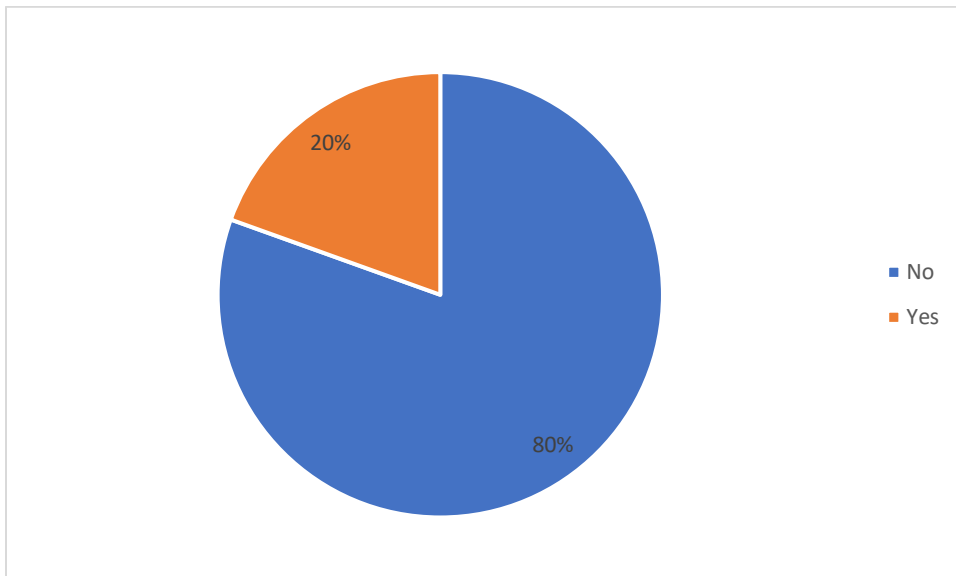


Figure 34. Have you served in the military or a volunteer program that grants you Federal hiring preference?

Length of Employment

Respondents were asked how long they have been employed at their current organization and how long they have held their current position (Table 61). Length of employment varied widely among respondents, from just 7 months to 38 years at their current organization. On average, respondents had been with their current organization for 11 years. Most respondents had been in their current position for over a year with an average over 4 years in their current position. Those respondents that had been with their current organization the longest, also tended to be in their current position the longest.

Table 61. Length of Employment

Agency Type	How long have you been employed by your current organization?	How long have you held your current position?
	8 years	Just started a new position May 1st
Municipal	20 yrs	3 yrs
Municipal	32 years	16 months
Other (please specify)	20 YEARS	3 YEARS
State DOT District	7 months	7 months
State DOT District	7 months	7 months
State DOT District	8 months	4 yrs
State DOT District	9 months	2 years and 4 months
State DOT District	10 months	10 months
State DOT District	1yr	1 yr
State DOT District	1 year	Half year
State DOT District	2 1/2 Years	1 Year
State DOT District	3 years	1.5 years
State DOT District	3 years	3 years
State DOT District	3 years	3yrs
State DOT District	3-4 years	3-4 years
State DOT District	4 years	1 year
State DOT District	5 years	1 year
State DOT District	5 years	1 year
State DOT District	5 years	2 years
State DOT District	6 years	6 years
State DOT District	8 years	2 years
State DOT District	8 years	8 years
State DOT District	10	5
State DOT District	10 years	7
State DOT District	10 years	8 years
State DOT District	11 YEARS	2 YEARS
State DOT District	12.5 years	5 years
State DOT District	13 yrs	13 yrs
State DOT District	14 years	2 years

State DOT District	14 yrs	2 yrs
State DOT District	14 years	6 years
State DOT District	15 years	12 years
State DOT District	15 years	6 years
State DOT District	15 years	7 years
State DOT District	18 yrs	5yrs
State DOT District	22.5 years	5 years
State DOT District	23 years	8 years
State DOT District	32 years	14 years
State DOT District	32 1/2 years	10 - 15 years
State DOT District	38 years	10 years

Career Change

Respondents were asked if this job was a second (major change or a post-retirement career (Figure 35). For 37 percent of respondents, winter maintenance was a second or post-retirement career.

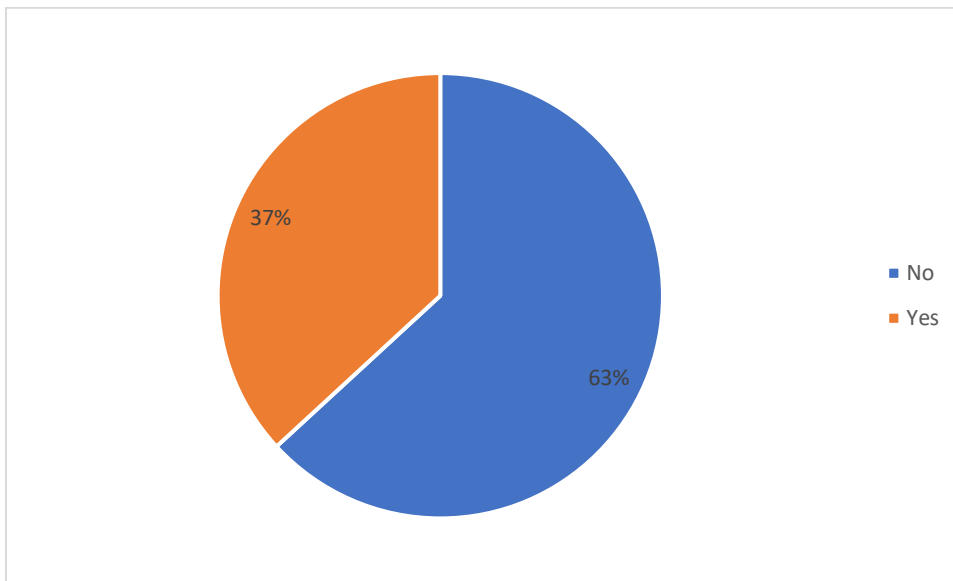


Figure 35. Is this job a second (major change) or post-retirement career?

Promotion

Respondents were asked if they had been promoted or reclassified since they were originally hired, 41 respondents provided information on whether they had been promoted (Figure 36). Most respondents (76%) had been promoted or reclassified since they were originally hired.

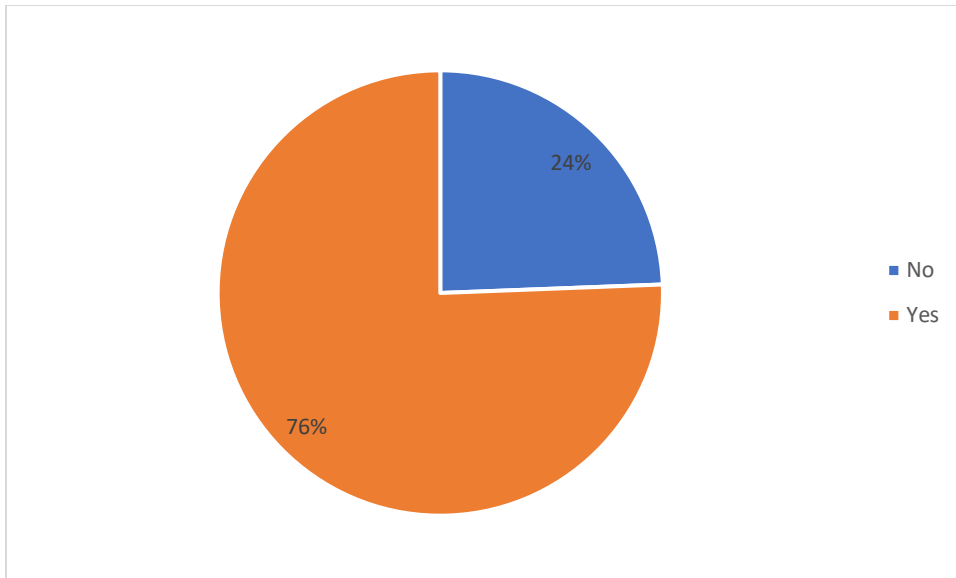


Figure 36. Have you been promoted or reclassified since originally hired?

Union

Highway maintenance positions tend to be unionized. Respondents were asked if they are a member of a union. Most respondents (66%) stated that yes, they are a union member (Figure 37).

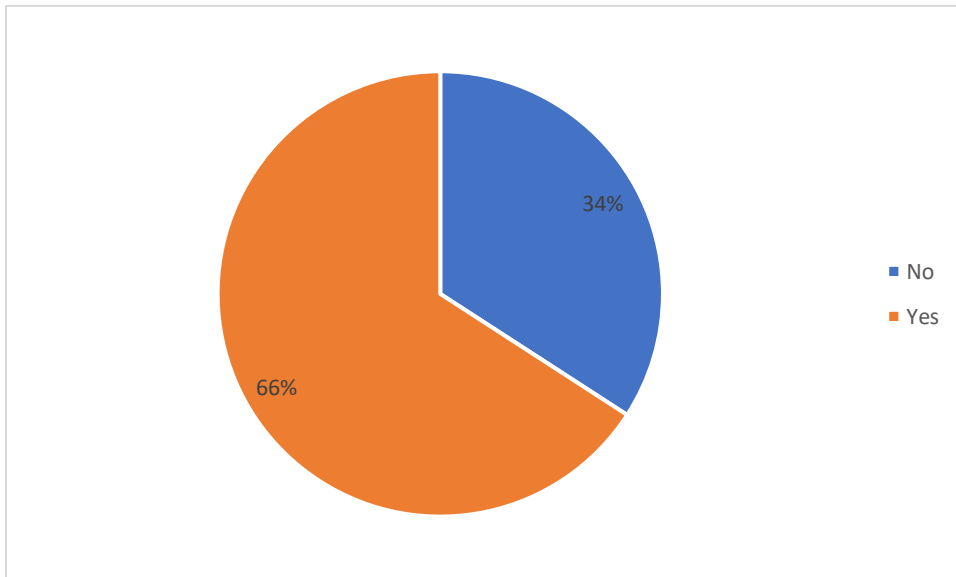


Figure 37. Are you a member of a union?

Job Posting Method

Respondents were asked how they found their current position, 41 respondents provided information on how their current job was advertised (Figure 38, Table 62). Just over half of respondents (56.1%) found their current position through word of mouth, which matches up with winter maintenance managers and HR managers felt that word of mouth was their most successful recruitment method. Respondents had also found their jobs through agency websites, employment websites, and workforce

centers. Two respondents stated they found their current job through another method, these included “Googling for jobs” and a road sign advertising the position.

Table 62. How did you find your current job?

How did you find your current job?	Total Respondents	Percent of Total Respondents (N=41)
Social Media	0	0.0%
Newspaper	1	2.4%
Employment Websites	5	12.2%
Agency Website	7	17.1%
Job Fairs	1	2.4%
Word of Mouth	23	56.1%
Headhunter	0	0.0%
Workforce Service Center	2	4.9%
Unions	0	0.0%
Other	2	4.9%

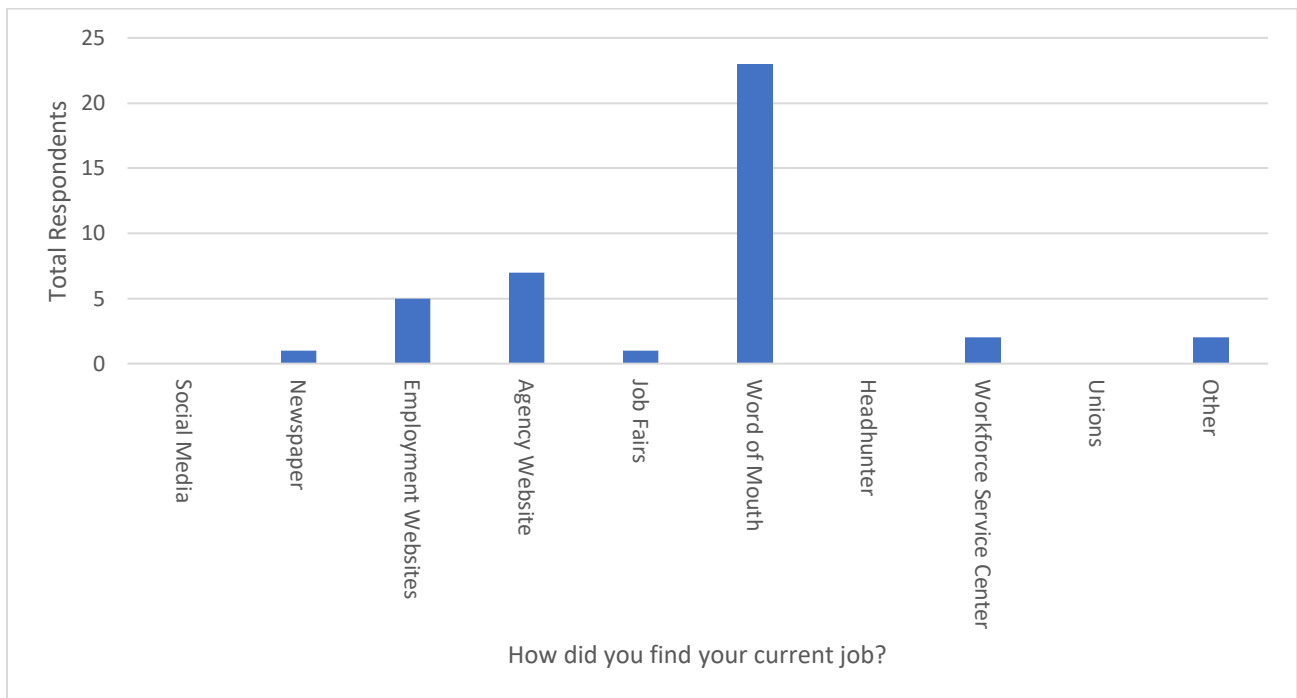


Figure 38. How did you find your current job?

What Attracted You to the Job

Respondents were asked what attracted them to the highway maintenance career, 40 respondents provided information (Figure 39, Table 63). Most respondents enjoyed the benefits (82.5% of respondents) and job security (70% of respondents) that highway maintenance work provided. Many respondents (42.5%) said that the type of work is what attracted them to highway maintenance. Three respondents answered that another reason attracted them to their job, these included learning new skills and looking for a new career.

Table 63. What attracted you to the job?

What Attracted You to the Job	Total Respondents	Percentage of Total Respondents (N=40)
Pay	2	5.0%
Benefits	33	82.5%
Job Security	28	70.0%
Type of Work	17	42.5%
Opportunities for Career Growth	10	25.0%
Work Schedule	9	22.5%
Operating Trucks/Equipment/Machinery	8	20.0%
Get a CDL	4	10.0%
Lack of Other Employment in My Area	3	7.5%
Pride in Serving My Community	9	22.5%
Other	3	7.5%

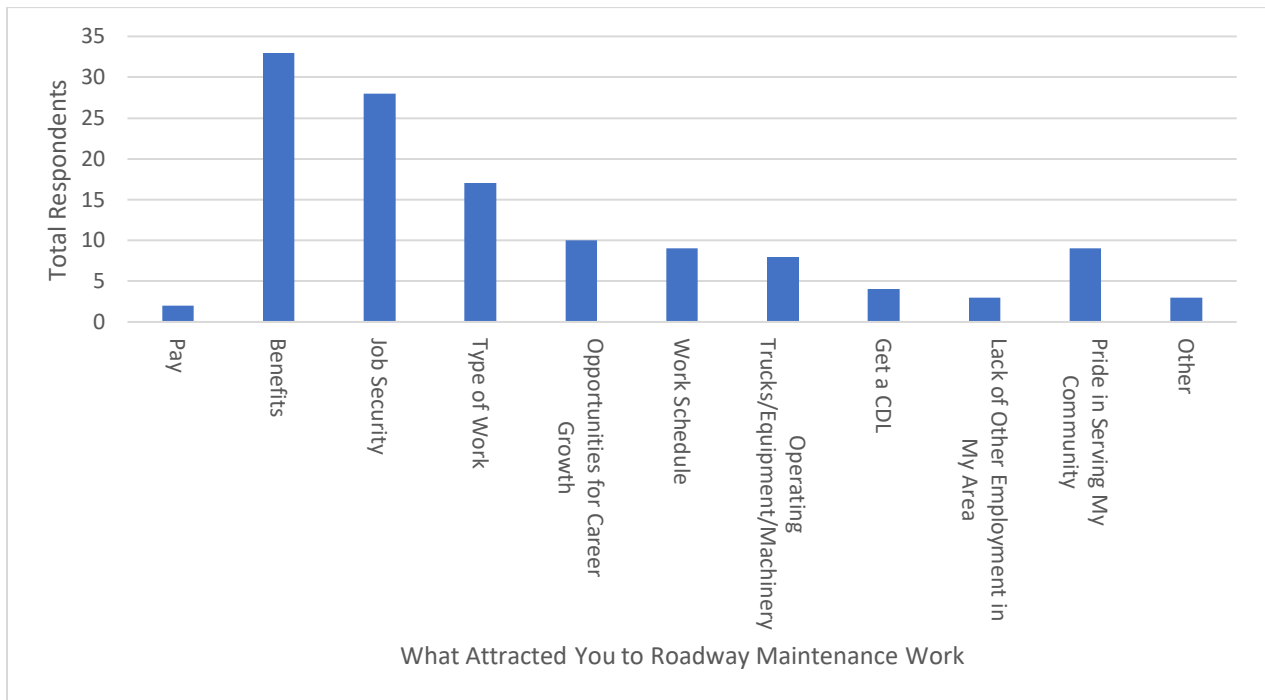


Figure 39. What attracted you to the job?

A follow-up question asked respondents which aspects of the job they value or enjoy the most. Many respondents mentioned enjoying plowing and working with equipment, as well as taking pride in their work and making sure the public is able to travel safely (Table 64). Other respondents mentioned enjoying working with their team or crew and that they get to be home with their family at night. Others mentioned enjoying that each day had different obstacles, flexibility, and working alone.

Table 64. What aspects of your position do you value or enjoy the most?

Agency Type	What aspects of your position do you value or enjoy the most?
	Flexibility
Municipal	Diversity
Other (please specify)	Keeping Interstate 81 safe for our community
State DOT District	All
State DOT District	Being a team member and serving the public.
State DOT District	Co workers
State DOT District	Different obstacles daily
State DOT District	Earned time off. Co workers
State DOT District	Enjoy bridge work
State DOT District	Every day is different, not doing the same thing all the time
State DOT District	helping motorists arrive at their destination safely.
State DOT District	I enjoy all of it
State DOT District	I like the flexibility with time off and opportunity to learn new skills
State DOT District	Job security
State DOT District	Left alone
State DOT District	Like being home with my family.
State DOT District	Most of it
State DOT District	None
State DOT District	Opportunities and type of work
State DOT District	Physical work
State DOT District	Plowing
State DOT District	plowing snow
State DOT District	plowing snow
State DOT District	Public service
State DOT District	Repairing damaged guardrail
State DOT District	RUNNING EQUIPMENT
State DOT District	Serving the public
State DOT District	Snow fighting, road maintenance, & my fellow crew members
State DOT District	Stability and schedule
State DOT District	Support from the team.
State DOT District	Taking pride in my work
State DOT District	Taking pride in the work I do and doing the job to the best of my ability
State DOT District	Teamwork, serving my community
State DOT District	The challenges of bridge repair and other projects
State DOT District	The variety
State DOT District	Working in a variety of areas and maintaining the roads my friends and family use on a regular basis.

Training Received

Respondents were asked if they had received any of the following training or other opportunities in their current position: technical training; CDL; safety training; promotion opportunities; mentoring; supervisory or leadership training; or others. Most respondents (87.8%) had received safety training (Figure 40, Table 65). Other common trainings included technical training (61% of respondents) and supervisory/leadership training (58.5%). Three respondents stated they had received another type of training, these included mechanical, pesticide, and welding trainings.

Table 65. Training or Other Opportunities Received

Training or Other Opportunities Received	Total Respondents	Percentage of Total Respondents (N=41)
Technical Training	25	61.0%
CDL (either initially or to upgrade)	13	31.7%
Safety Training	36	87.8%
Promotion Opportunities	18	43.9%
Mentoring	10	24.4%
Supervisory/Leadership Training	24	58.5%
Other Training or Opportunities	3	7.3%



Figure 40. Training or Other Opportunities Received

A follow up question asked respondents were asked which trainings were most helpful for their current position, a wide variety of trainings were listed from equipment training to OSHA to technical trainings (Table 66). Some respondents felt that supervisory and leadership trainings were the most helpful. One respondent took a WISE college snow fighting course.

Table 66. Most Helpful Training

Agency Type	What training was most helpful for your current position?
	Technical training
Municipal	Technical training
Other (please specify)	All training is very helpful
State DOT District	All
State DOT District	All
State DOT District	Any equipment training however there isn't much available
State DOT District	CDL
State DOT District	CDL
State DOT District	CDL
State DOT District	CDL
State DOT District	CDL
State DOT District	CDL training
State DOT District	Farming background construction work
State DOT District	Knowledge of transportation operations
State DOT District	Mentoring
State DOT District	More in general
State DOT District	NAPA classes on different systems in our fleet
State DOT District	None
State DOT District	On the job
State DOT District	On the job
State DOT District	OSHA 30
State DOT District	Safety
State DOT District	Safety training
State DOT District	Safety training and the CDL to perform the job
State DOT District	Snow Fighter
State DOT District	Supervisor
State DOT District	Supervisory leadership training
State DOT District	SUPERVISORY/LEADERSHIP TRAINNING
State DOT District	Technical
State DOT District	Technical Training
State DOT District	Technical Training. It helped me perform and do jobs in a safe manner
State DOT District	Technical training for bine machine
State DOT District	WISE college (snow fighting course)

Leaving/Returning to the Transportation Sector

Respondents were asked if they had left a job in the transportation sector in the last 5 years (Figure 41). Most respondents (90%) had not left a job in the transportation sector in the last 5 years. Only 10% of respondents (4 respondents) had recently left a job in the transportation sector. These respondents were asked a follow up question to share the reason for their departure (Table 67). Reasons for leaving the transportation sector included schedule, pay, or moving switching careers to the State DOT.

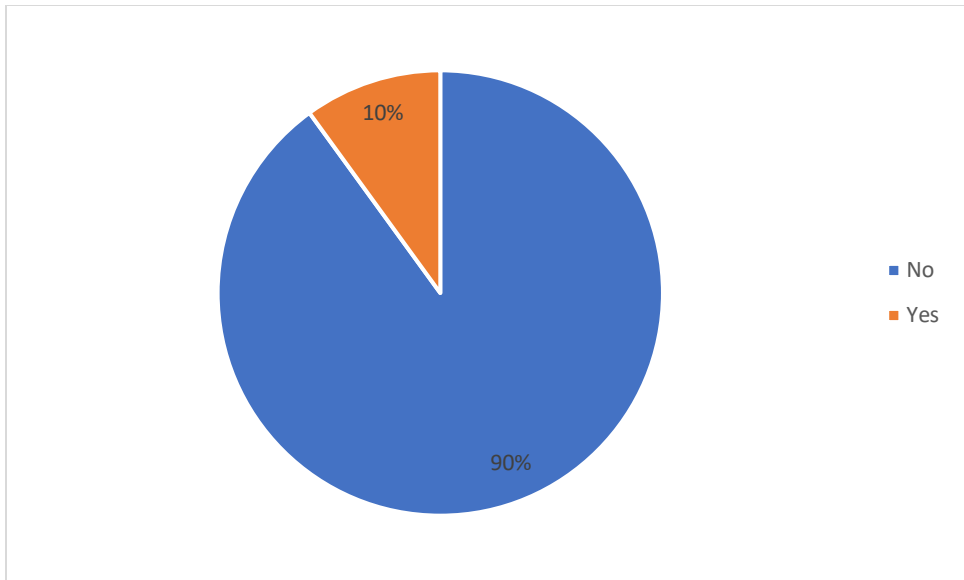


Figure 41. Have you left a job in the transportation sector in the last 5 years?

Table 67. Reason for Leaving the Transportation Sector

Agency Type	Have you left a job/position in the transportation sector in the last 5 years?	Please share the reason for your departure.
State DOT District	Yes	Came to State DOT
State DOT District	Yes	Wanted to be home nightly and weekends to enjoy my family
State DOT District	Yes	I stayed at my camp but had to switch over to contracted employee then back to MDOT
State DOT District	Yes	Left due to the schedule and pay,

Respondents were then asked if they had returned to a job in the transportation sector within the last 5 years (Figure 42). Most respondents had not recently returned to a position in the transportation sector. A few respondents (10%) had recently returned to the transportation sector, these respondents were asked a follow up question to share the reason for the return (Table 68). Reasons for returning to the transportation sector included transferring from truck driving, enjoying the job, and starting a new position.

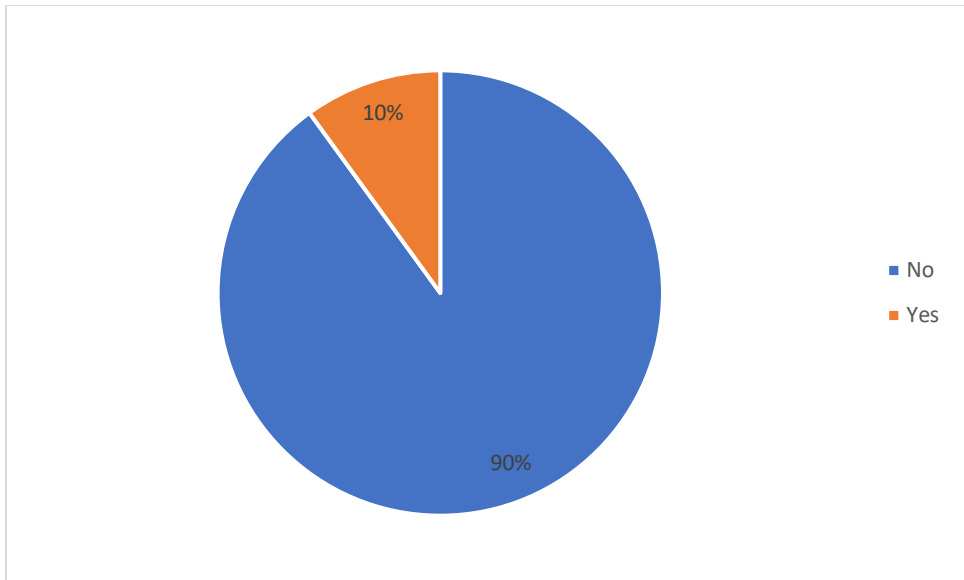


Figure 42. Have you returned to a job in the transportation sector in the last 5 years?

Table 68. Reasons for Returning to the Transportation Sector

Agency Type	Have you returned to a job/position in the transportation sector in the last 5 years?	Please share the reason for your return.
State DOT District	Yes	Enjoy the work
State DOT District	Yes	Just transferred from truck driving to road maintenance
State DOT District	Yes	Contract went away
State DOT District	Yes	New position

What Do You Like the Most/Least About Your Job

Respondents were asked what they liked the most and the least about their job (Table 69). Considering the aspects respondents enjoyed about their job, many respondents enjoyed the variety of work with many mentioning that they enjoy plowing snow. Other reasons mentioned included being outdoors, problem solving, independence, and the teamwork environment.

Respondents listed a variety of things that they liked the least about their job, ranging from the schedule to politics. Respondents also listed that they did not enjoy the lack of communication, lack of training opportunities, paperwork, and dealing with extreme situations at times.

Table 69. What do you enjoy the most and the least about your job?

Agency Type	What do you like the most about your job?	What do you like the least about your job?
	The opportunity to use sick and annual leave	Our budget, The last 5 years all we have heard is this in not going to be a good year.
Municipal	Allowed to investigate new technology	Data entry
Municipal	Working with people	Politics
Other (please specify)	The work we do	A hard winter
State DOT District	Learning new skills	2 am call ins
State DOT District	Time off	Barriers to taking classes
State DOT District	Plowing	Carcass retrieval
State DOT District	Plowing snow	Crack sealing
State DOT District	Day to day work	Day to day work
State DOT District	Physical work	Dealing with the newer employees and how they feel they are entitled
State DOT District	PLOWING	DEALING WITH WHINEY PEOPLE
State DOT District	Challenge/ problem solving	Employee issues
State DOT District	Plowing snow	Guardrail
State DOT District	Benefits	Hourly pay rate
State DOT District	Fast pace	HR
State DOT District	I like the variety of jobs we perform in maintenance. Plowing, culvert repair, road repair, etc.	I honestly have to say I like my job.
State DOT District	Working with the group	Lack of communication
State DOT District	Snow fighting	Litter picking
State DOT District	Hours/ and time off	Maintenance of trucks and flagging
State DOT District	We are tasked with different jobs all the time, so variety is my most favorite	My least favorite is probably the hours that we work in the wintertime
State DOT District	Bridge work	N/A
State DOT District	Security	Nonexistent training
State DOT District	Independence	Not being challenged enough.
State DOT District	Coworkers	Not being to perform duties because lack of money
State DOT District	Workers	Nothing
State DOT District	Teamwork environment	Occasional long days.
State DOT District	Plowing snow	Our leadership
State DOT District	Being outdoors	Paperwork
State DOT District	Job duties	People inter-personal [issues]
State DOT District	Finding way to do things better	Politics
State DOT District	The workers	Politics
State DOT District	My supervisor	Senior maintenance worker
State DOT District	Vacation days	Supervision

State DOT District	The variety and the people	The micro-management
State DOT District	The work	The pay!
State DOT District	Serving public	Trying to do too much with too little
State DOT District	Room for advancement and benefits	Working in extreme weather on occasion.
State DOT District	Plowing snow	Working with troublemakers

A follow up question asked respondents why they stayed in this job (Table 70). Many respondents listed that they enjoyed what they do including that they took pride in their work or enjoyed the challenge. Others enjoyed the benefits and retirement plan. Some respondents listed job security as the reason why they stay.

Table 70. Reasons for Staying in the Job

Agency Type	Why do you stay in this job?
	Have not found something else I want yet.
Municipal	Enjoy what I do
Municipal	I like what I do and benefits
Other (please specify)	Enjoy what I do
State DOT District	Age and money finally mostly ignorance
State DOT District	Another retirement and benefits
State DOT District	Because I like the type of work and benefits are a plus.
State DOT District	Benefits
State DOT District	Benefits job security
State DOT District	Benefits. Good ratio of time off and working
State DOT District	Close to home
State DOT District	Commute, work, people
State DOT District	Good benefits and stability
State DOT District	I like my job, like being home at night
State DOT District	I like the work
State DOT District	I like the work and the things we do
State DOT District	It's a good job with good benefits
State DOT District	IT'S FUN AND CHALLENGING, BENEFITS, PAY, AND CLOSE TO HOME
State DOT District	Job security and benefits
State DOT District	Job security
State DOT District	Love it
State DOT District	Mostly benefits
State DOT District	Paid time off
State DOT District	Positioning for eventual retirement
State DOT District	Retirement
State DOT District	Retirement
State DOT District	Retirement
State DOT District	Retirement

State DOT District	Retirement opportunity, pride in my job and health insurance.
State DOT District	Satisfaction of seeing a job well done, watching others get the same satisfaction.
State DOT District	Security
State DOT District	Security and co workers
State DOT District	Still like the work
State DOT District	Still new. Benefits and potential pension
State DOT District	The benefits
State DOT District	To serve the public and to have the ability to do different job duties within MnDOT.
State DOT District	Work till I die plan

Reasons to Leave the Organization

Respondents were asked to provide the reasons why they would leave their current organization beyond retirement (Figure 43, Table 71). Moving to a different area and winning the lottery were common answers for why a respondent would leave their current organization. Few respondents stated that a career change or starting their own business would cause them to leave their organization. Five respondents stated that there was another reason why they would leave. These reasons included working environment, coworkers, and senior maintenance.

Table 71. Other than retirement, what would cause you to leave your current organization?

Other than retirement, what would cause you to leave your current organization?	Total Respondents	Percentage of Total Respondents (N=37)
Career Change	5	13.5%
Better Pay/Benefits Elsewhere	13	35.1%
Better Working Conditions/Schedules	9	24.3%
Personal or Family Issues	13	35.1%
Start Own Business	7	18.9%
Move to a Different Area	16	43.2%
Win the Lottery	17	45.9%
Other	5	13.5%

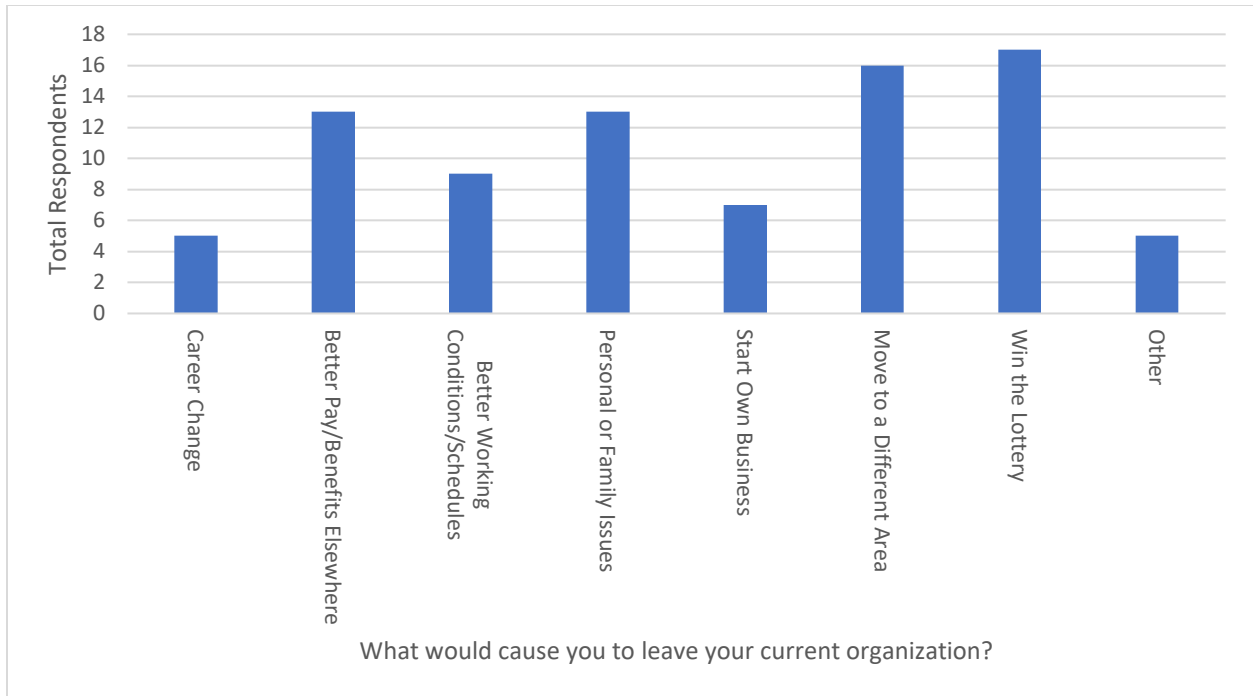


Figure 43. Other than retirement, what would cause you to leave your current position?

A follow up question asked respondents why they think *others* leave employment at their current agency. Many respondents believe others leave their agency due to better pay or benefits elsewhere (84.2%) (Table 72). Better working conditions or schedules were also a commonly listed reason for leaving (60.5%). Six respondents (15.8%) listed other reasons why they think others leave their agency. These reasons included negative treatment from coworkers, personality conflicts, scheduling issues, and regulations.

Table 72. Why do you think others leave employment with the agency?

Why do you think other leave employment with the agency?	Total Respondents	Percentage of Total Respondents (N=38)
Career Change	9	23.7%
Better Pay/Benefits Elsewhere	32	84.2%
Better Working Conditions/Schedules	23	60.5%
Personal or Family Issues	10	26.3%
Start Own Business	8	21.1%
Move to a Different Area	10	26.3%
Win the Lottery	2	5.3%
Other	6	15.8%

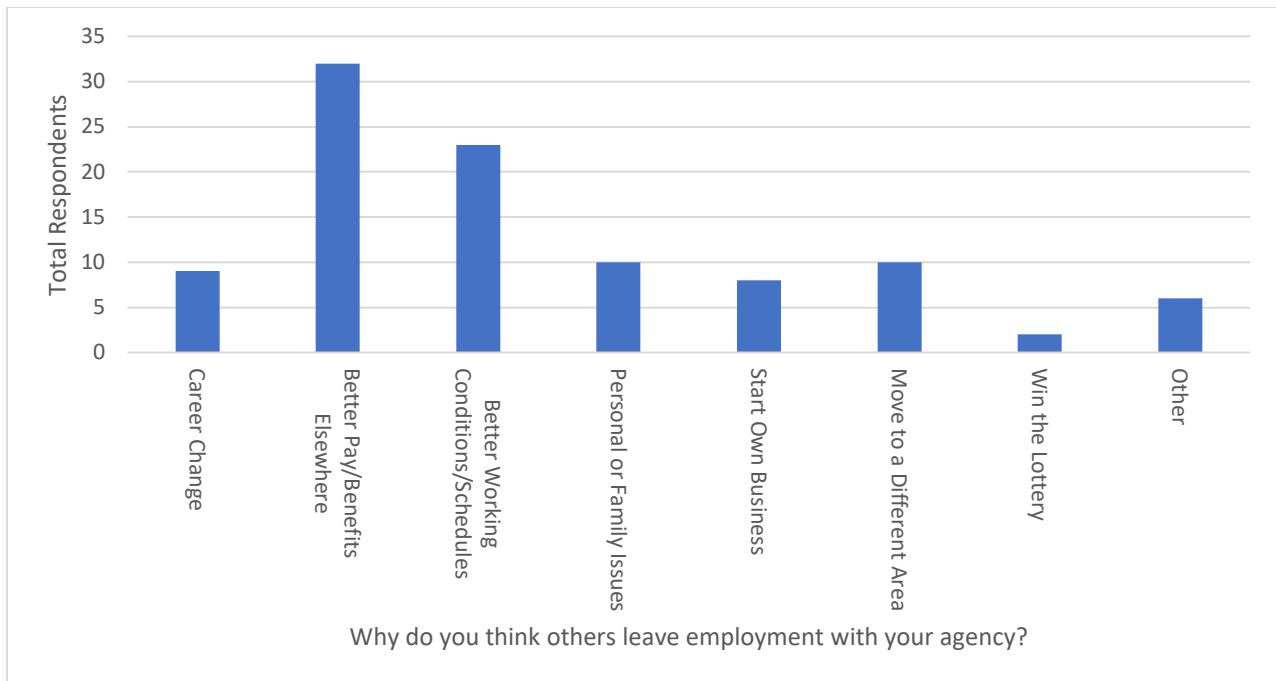


Figure 44. Why do you think others leave employment with the agency?

Table 73. Other Reasons for Leaving the Agency

Agency Type	Other Reasons for Leaving
State DOT District	Negative treatment from existing workers
State DOT District	Because they don't want to work
State DOT District	Handicapped by budget, environmental laws, senseless rules,
State DOT District	[Interpersonal issues]
State DOT District	Not home with families enough during the winter months
State DOT District	Personality conflicts and people can't act like adults.

Improving Career Satisfaction

Respondents were asked what steps their agency could take to enhance their career satisfaction over the long term (Figure 45, Table 74). Most respondents (81.6%) stated that increasing their pay would improve their career satisfaction. Merit-based pay and improved facilities or equipment were also common answers (over 40%). Few respondents listed that mentoring opportunities or improving workplace diversity would increase job satisfaction. Six respondents stated other steps their agency could take to improve job satisfaction (Table 75), these included holding people accountable, improving communications, providing overtime during the summer, and better benefits.

Table 74. What steps can your agency take to enhance your career satisfaction in the long term?

Steps Your Agency Can Take to Enhance Your Career Satisfaction	Total Respondents	Percentage of Total Respondents (N=38)
Professional Development Offerings	12	31.6%
Employee/Performance Recognition and Awards	13	34.2%
Mentoring Opportunities	6	15.8%
Career Ladder/Career Mobility	12	31.6%
Increased Communication and Relations between Supervisors and Workers	15	39.5%
Merit/Performance-Based Raises	17	44.7%
Change in Leadership (upper managers and directors)	9	23.7%
Improved Workplace Climate	13	34.2%
Improved Facilities and Equipment	16	42.1%
Increased Workplace Diversity	6	15.8%
Increased Flexibility/Work-Life Balance	9	23.7%
Increased Pay	31	81.6%
Improved Benefits	14	36.8%
Other	6	15.8%

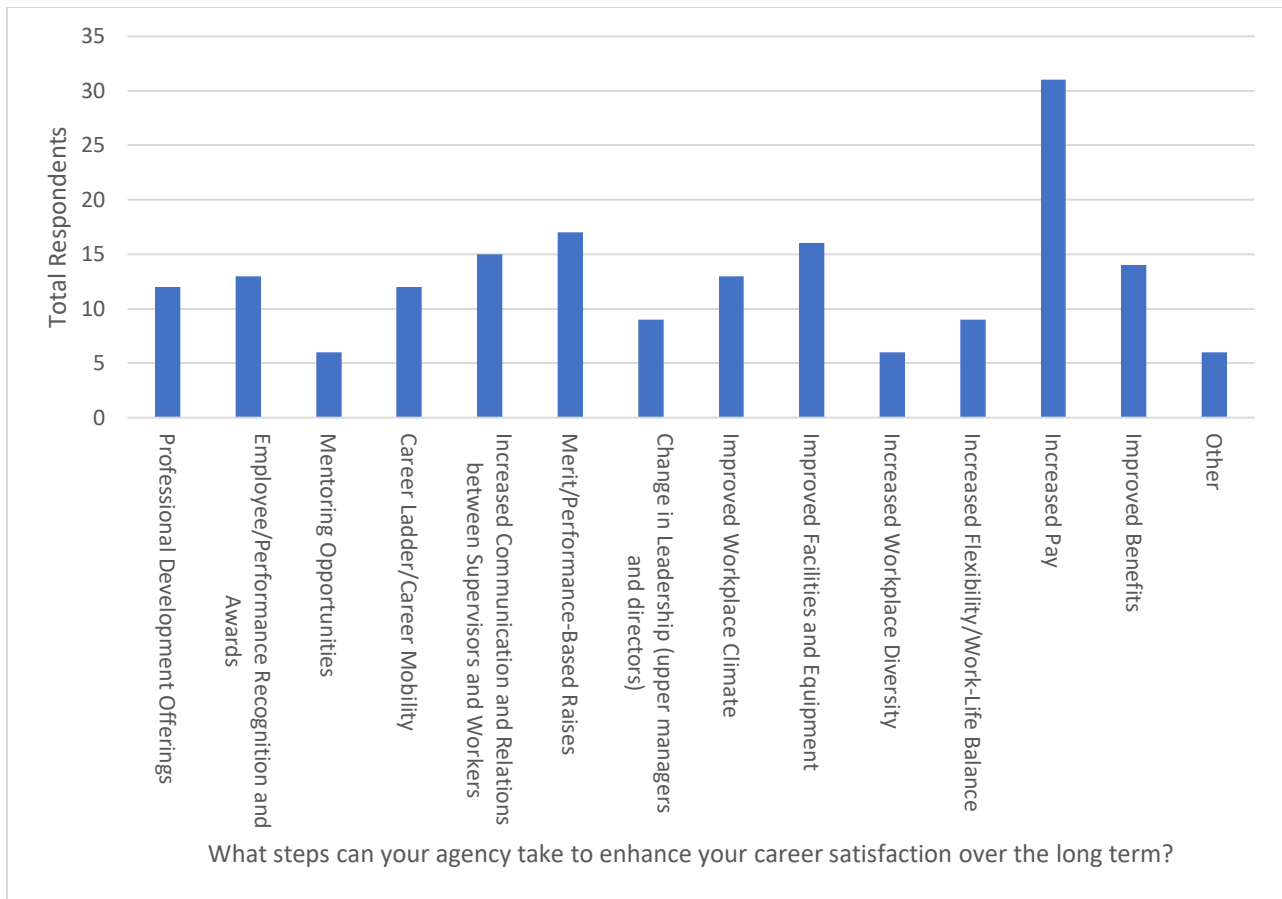


Figure 45. What steps can your agency take to enhance your career satisfaction in the long term?

Table 75. Other Steps to Improve Job Satisfaction

Agency Type	Other Steps to Improve Job Satisfaction
State DOT District	Hold people accountable for their behavior
State DOT District	Improved communication from the upper management
State DOT District	Overtime in the summer more productive and satisfying work
State DOT District	Screening process of hiring candidates
State DOT District	Top level dental coverage instead of one the dental offices laugh about
State DOT District	Transfer the Senior maintenance worker in St. Albans back to high gate for starters

Would You Recommend Employment

Respondents were asked if they would recommend employment at their current organization to a friend or family member (Figure 46, Table 76). Most respondents stated that they would recommend employment at their organization (56.8%) or that they would recommend employment but with reservations (29.7%). Follow up questions asked respondents to explain their response (Table 77). For those respondents that would recommend employment at their agency but with reservations, these reasons included that they would need to be flexible with their schedule, the ability to handle politics, and warnings about initial pay. For those that did not recommend employment at their agency, reasons

included limitations in work-life balance due to the schedule required, budget restrictions, and issues with managers.

Table 76. Would you recommend employment at your current organization?

Would you recommend employment at your current organization to a friend of family member?	Total Respondents	Percentage of Total Respondents (N=37)
Yes	21	56.8%
Yes, But...	11	29.7%
No, Because...	5	13.5%

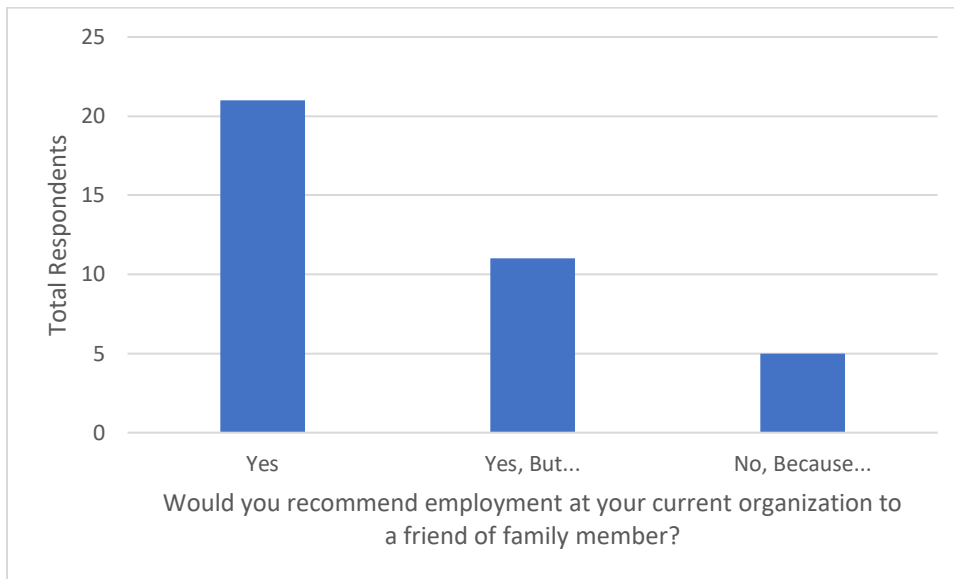


Figure 46. Would you recommend employment at your current organization?

Table 77. Reasons Why You Would/Would Not Recommend Employment at the Organization

Agency Type	Would you recommend employment at your current organization to a friend or family member?	Explanation
State DOT District	No, because (please explain)	You are severely limited in having a balanced family life with this job. Case in point I have been off the clock for 3 hours and expected to do this survey. Won't have time during normal hours to fit in.
State DOT District	No, because (please explain)	There are more manager types than working types. And you often have to beg to purchase what you need to do your job including emergency response.
State DOT District	No, because (please explain)	Not rewarding

	No, because (please explain)	Not right now, with the budget. It is the only job I have had that the longer you stay, you can see your paycheck go down.
State DOT District	No, because (please explain)	Only work associates period. The bosses have major favorites, but you can't talk about that
State DOT District	Yes, but... (please explain)	It takes over your life
State DOT District	Yes, but... (please explain)	Leave common sense at home
State DOT District	Yes, but... (please explain)	Ability to deal w/politics
State DOT District	Yes, but... (please explain)	It would need to be a good fit.
State DOT District	Yes, but... (please explain)	Nepotism
State DOT District	Yes, but... (please explain)	They have to be flexible with the hours
State DOT District	Yes, but... (please explain)	They need to not be sensitive to co-workers bad attitudes, laziness
State DOT District	Yes, but... (please explain)	Not sure if I would
State DOT District	Yes, but... (please explain)	Be careful
State DOT District	Yes, but... (please explain)	Warn them about initial pay and handicaps

Additional Information Related to Winter Maintenance Work

A final question asked respondents to share any additional thoughts or information on their experience as winter maintenance workers or if they had suggestions to increase recruitment or retention at their agency, 23 respondents provided additional information (Table 78). Most respondents noted that the pay is a large barrier to employment in their field, with some noting that it is especially difficult for younger employees with a family to live with the current pay, others noting that they are paid as if they are unskilled and expendable. One respondent noted that pay based off of equipment or other qualifications would be beneficial. Others noted the need to ensure the public understand the importance of highway maintenance work in improving safety for the traveling public.

Table 78. Additional Thoughts

Agency Type	Additional Thoughts/Comments
State DOT District	Being a state municipality, the budget is tighter than local municipalities. So, the pay is less and the equipment is not as good.
State DOT District	Better pay would attract more people but if we pay new employees better than we have to pay our current workers more too
State DOT District	Enough of a work force to actually meet what management wants done (run 2 shifts during the winter)

State DOT District	Everyone that is any good has always left for much better pay. Especially younger people with families to take care of they just can't make it on \$15 something an hour. So, they find jobs that pay double or more. The older ones stay because they've already had careers in other fields. To them it is just a job until retirement
State DOT District	Give proper training time and not just this is the route, you'll figure it out
State DOT District	Go somewhere else
State DOT District	I believe lower level managers should have to have had experience in the work that they are managing. The disconnect between managers and workers has grown too large and the head has no idea what the body needs to do.
State DOT District	I just wish I have more hands-on training
State DOT District	I think it all comes down to money
State DOT District	Increase pay to prevent workers from using DOT to get necessary training then go elsewhere for better pay
State DOT District	Initial pay is definitely a major cause. When we get a young man or woman who WANTS to work, they are quickly disappointed by the environmental, safety and budget constraints. I love Vt and am an outdoor enthusiast. I appreciate environmental stewardship. I am 55 years old and appreciate safety. I live in one of the most expensive states in the union and know the importance of having a budget. I think reducing these handicaps and allowing more summertime overtime could increase summer time attendance and productivity. We starve in the summertime and many of us use our time and talents to moonlight. Offering reasonable OT could increase attendance, productivity and moral.
State DOT District	It has been my experience that many people have left or failed to apply because of the lack of pay.
State DOT District	It really is life changing and you are owned. I'm a firm believer that if you are owned you should be getting rich
State DOT District	It's long hours and it would be good to have more people to take over a plow route when a break is needed. Job fairs seem to be a good way to get more applications. Better prior reference checking on prospective new hires.
State DOT District	Long hard hours in the winter, but plenty of time off in the summer
State DOT District	Long nights, cold weather, lack of sleep, and lack of the public thankfulness-make people aware of what we relay do and go through to keep their roads up and what we put asides in our life to serve them
State DOT District	Offer upgrades based on performance and productivity not on years of service and hold all employees at any level to same standard of a. Accountability
State DOT District	Pay based on equipment qualifications
State DOT District	Salary needs to increase. Hire more help.
State DOT District	Stop paying us like we are unskilled and expendable. Spend 16 plus hours behind the wheel of 75 thousand pounds in a freezing rainstorm or snow storm. It takes skill and nerves of steel. You can't compete with a construction company when you want to pay a seasoned driver \$16 an hour when they make \$22
State DOT District	The upper management needs to see more of the challenges the lower employees face with bad equipment and environments we work in on a day to day basis.
State DOT District	There's a lot of talk and no action from upper management! They forgot where they came from

State DOT District Until I started working for MnDOT I didn't realize how important roadway/winter maintenance workers are. From plowing to removing road debris to make the roads safe to travel. The suggestion I would have to attract and keep good workers in MnDOT is to change the interview process slightly. Hire some of the applicants who don't interview well. The last thirty plus years my wife has been on the interview panel at her place of employment. She has told me repeatedly the ones that don't interview well turn out to be some of her best employees. A lot job applicants can be nervous and cause them not to interview well and there is a few that can talk the talk.

Private Contractor Survey

This survey had a total of 3 respondents.

Respondent Information

The first question asked respondents to provide information on their company and job title (Table 79). Respondent companies had a variety of main business purposes including highway maintenance, distribution of deicing products, and excavation.

Table 79. Respondent Company and Job Title

Job Title	Company	Location	Main Business
General Manager	East End Crossing Partners	Jeffersonville, Indiana	Highway Maintenance
Vice President of Business Development	J. DeFillip Sales	Pittsburgh, PA	We are a wholesale distributor of deicing products
President	MIDI CONSTRUCTION LTD.	Saint John, NB, CA	Excavation

Respondents were asked what percentage of their business was contracted snow removal. Two respondents noted that 25% of their business was contracted snow removal. One respondent (J. DeFillip Sales) noted that none of their business was contracted snow removal.

Respondents were then asked if they contracted any of their business with the following: municipal (town, city, regional authority), county, or state. One respondent (33.3%) stated that they contract with a state agency and another respondent stated they contract with a municipal (town, city, regional authority) agency.

Worker Shortage

Respondents were asked if they have experienced a shortage of qualified snow removal workers within the past 3 years (Table 80). Two respondents (66.7%) stated that yes, they did experience a shortage of workers. A follow up question asked what percentage of their snow removal workforce their company needed to fill. One respondent needed to fill just 5% of their workforce, the other needed to fill 20% of their workforce. Finally, respondents were asked if their company had lost business over the past 3 years due to a lack of qualified snow removal workers. Only one respondent (33.3%) stated that yes, they had lost business due to a lack of qualified workers.

Table 80. Worker Shortages

Company	Has your company experienced a shortage of qualified snow removal workers in the past 3 years?	What percentage of your snow removal workforce do you need to fill?	Has your company lost business over the past 3 years due to a lack of qualified snow removal workers?
East End Crossing Partners	Yes	20%	No
J. DeFillip Sales	No		No
MIDI CONSTRUCTION LTD.	Yes	5%	Yes

Snow Removal Workforce

Respondents were asked to provide information on their snow removal workforce (Table 81). First, respondents were asked to provide the total number of snow removal workers they employed during the 2019-2020 winter seasons that were employed directly and sub-contracted (operator and truck). Snow removal workforces were small and mostly consisted of employees that were employed directly with the company.

Respondents were then asked to provide the approximate percentage of their snow removal workforce that was either; full-time, permanent staff, part-time, year-round staff, and seasonal/temporary. For one respondent their entire snow removal workforce was made up of full-time, year-round employees. The other respondent stated that their snow removal workforce was 50%/50% full-time and part-time, year-round employees.

Table 81. Snow Removal Workforce

Company	How many snow removal workers did you employ during the 2019-2020 winter season?		Approximately what percentage of snow removal workers are:		
	Employed Directly:	Sub-Contracted (operator and truck):	Full-Time, Permanent Staff:	Part-Time, Year-Round Staff:	Seasonal/Temporary:
East End Crossing Partners	7		100		
J. DeFillip Sales	0	0	0	0	0
MIDI CONSTRUCTION LTD.	12	2	50%	50%	

Respondents were asked to provide information on the hourly wage range for their entry-level snow removal workers. One respondent was paying entry-level workers between \$15 and \$19 per hour, another paid their entry-level workers \$20 per hour.

Recruitment and Retention of Employees

Respondents were asked which factors negatively affected their company's ability to recruit, hire, and retain snow removal workers (Figure 47, Table 82). Respondents noted a variety of factors affecting their ability to recruit, hire, and retain snow removal workers. Two respondents (66.7%) stated they struggled with poor or unsuitable prior employment and applicants lacking the requisite minimum skills/experience levels. Pay scale and benefits packages did not seem to be a limiting factor. Neither did work schedules, physical and drug test requirements, CDL requirements, working conditions, poor perception of the job, or relocations.

Table 82. Negative Factors Impacting Ability to Recruit, Hire, and Retain Employees

Negative Factors Impacting Recruitment, Retention of Employees	Total Respondents	Percentage of Total Respondents (N=3)
Pay scale not competitive enough with other industries	0	0.0%
Benefits package (health insurance, pension, etc.) not competitive	0	0.0%
Competition with public and other private sector employers	1	33.3%
Work schedule (days/hours) unfavorable	0	0.0%
Applicants lack requisite minimum skills/experience levels	2	66.7%
Physical and drug test pre-employment requirements	0	0.0%
Background checks (criminal, civil, driving records)	0	0.0%
Poor or unsuitable prior employment record	2	66.7%
CDL requirement (pre-employment)	0	0.0%
Routine job duties considered undesirable	1	33.3%
Working conditions considered unfavorable (safety concerns, cold, etc.)	0	0.0%
Unpredictability/irregularity of snow duty (shifts/hours, standby restrictions, etc.)	1	33.3%
Lack of career development, advancement opportunities	1	33.3%
Poor perception of the job	0	0.0%
Hiring process too slow, cumbersome	0	0.0%
Employee unable to renew CDL or DOT card due to chronic medical condition	0	0.0%
Dismissal due to unsatisfactory performance, accidents, traffic violations, etc.	1	33.3%
Relocations	0	0.0%
Other	0	0.0%

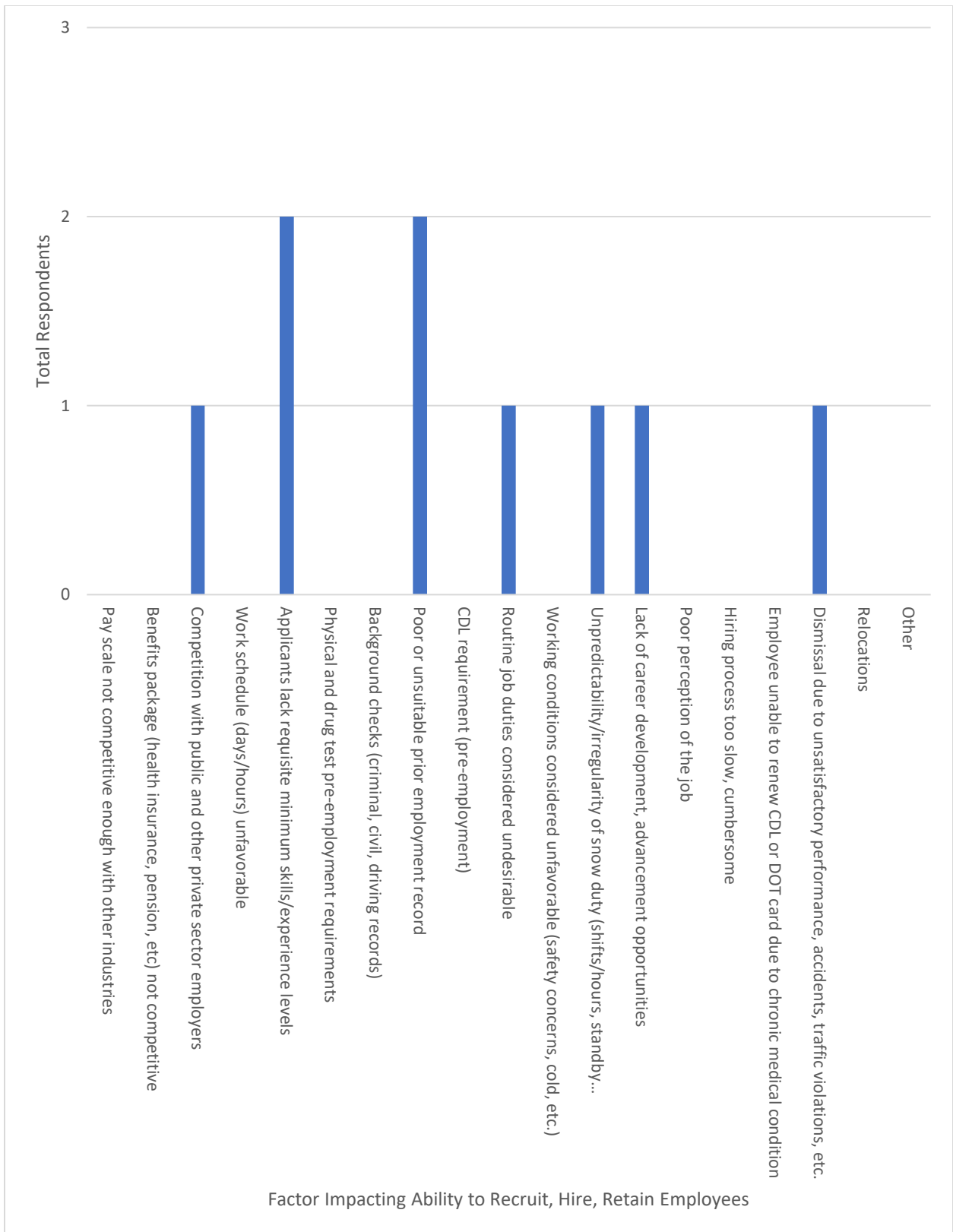


Figure 47. Factors Negatively Impacting the Ability to Recruit, Hire, Retain Employees

Respondents were asked to provide information on their successful recruitment strategies implemented at their company (Table 83). Strategies mentioned benefits packages including free gym memberships and providing employees with new equipment. A follow up question asked respondents if they had tried recruitment strategies that they found to be unsuccessful, only one respondent (33.3%) stated yes. The unsuccessful strategy was referral bonuses for existing employees.

Table 83. Successful and Unsuccessful Recruitment Strategies

Company	What successful strategies has your company used to attract job applicants?	Have you tried recruitment strategies that you found to be unsuccessful?	Please describe the recruitment strategies that you found to be unsuccessful.
East End Crossing Partners	Full health insurance premium paid, HSA employer contribution match up to \$1500 per year, 4% 401K match, free gym membership	Yes	referral bonuses for existing employees
J. DeFillip Sales		No	
MIDI CONSTRUCTION LTD.	new equipment	No	

Retention of Employees

Respondents were asked what level of difficulty their agency faced in retaining snow removal workers. Two respondents (66.7%) stated that they had some difficulty. One respondent stated none, but this respondent also noted that they did not have a snow removal workforce.

Respondents were asked for the reasons that their employees were leaving (Figure 48, Table 84). Two respondents (66.7%) faced issues with employees leaving due to termination for unsatisfactory performance, absenteeism. A variety of other reasons were noted including relocation, better pay and/or benefits, and personal or family issues. One respondent stated other and noted that a lack of snow equaled a lack of full-time employment.

Respondents were asked what factors contributed to their ability to retain snow removal workers. Factors mentioned included benefits packages and the ability to obtain year-round employment.

Table 84. Reason for Employees Leaving the Company

Reason Employees Leave	Total Respondents	Percent of Total Respondents (N=3)
Retirement	0	0.0%
Relocation	1	33.3%
Unable to obtain/renew CDL	0	0.0%
Career change	0	0.0%
Better pay/benefits	1	33.3%
Failed alcohol or drug testing	0	0.0%
Personal or drug testing	1	33.3%
Personal or family issues	0	0.0%
Disability	0	0.0%
Lack of advancement	0	0.0%
Termination for unsatisfactory performance/absenteeism	2	66.7%
Other	1	33.3%

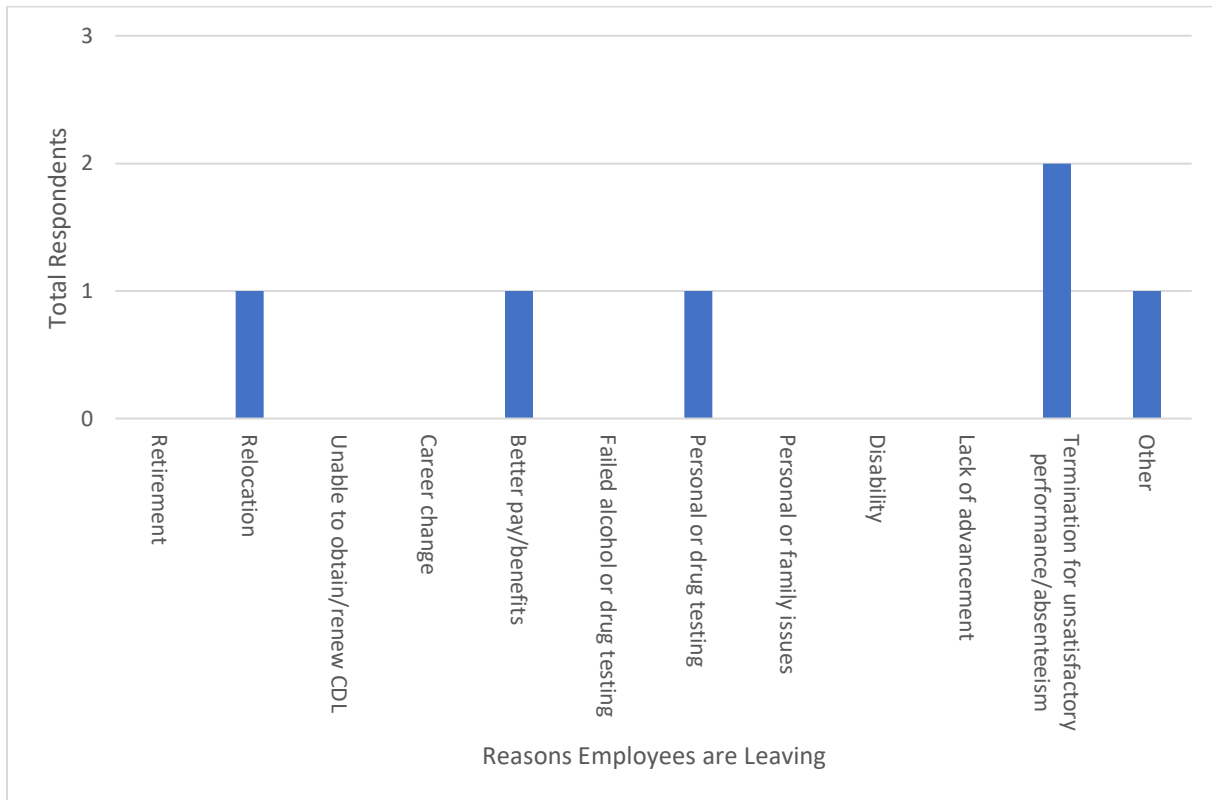


Figure 48. Reasons for Employees Leaving

Exit Interviews

Exit interviews can provide meaningful feedback on why an agency may be struggling to retain employees. Respondents were asked if their company conducted exit interviews, only one respondent (33.3%) stated yes. A follow up question asked which questions they found to be most helpful or insightful in their exit interview process. This respondent found questions related to the treatment of employees by their direct supervisor to be the most helpful.

APPENDIX C – SURVEY INSTRUMENTS

Clear Roads - Recruitment and Retention of Highway Maintenance Workers

Start of Block: Introduction

Introduction (All Respondents)

Q1 This survey has been created to support Clear Roads and its members in their identification of employee recruitment and retention strategies, specifically highway maintenance workers engaged in snow and ice control. Information gathered in this survey will be used to create case studies on specific topics that highlight best practices for recruitment and retention. This information will be used to produce a concise guide of innovative and practical methods for State/ Provincial Departments of Transportation and municipal and county Departments of Public Works to recruit and retain highly proficient and committed highway maintenance workers. While participation in this survey is voluntary, we hope that you will share your knowledge. The survey should take around 5 to 20 minutes to complete. Any questions or comments can be directed to Karalyn Clouser of the Western Transportation Institute at Montana State University at karalyn.clouser@montana.edu or 406-529-0654. Thank you for your time. NOTE: This project was initiated in 2019 when the unemployment rate was very low, the national economy was strong, and most state and local agencies had adequate funding. Responses to the following questions should be based on agencies' experiences in the years 2014-2019. Obviously, the current pandemic has drastically affected revenues for state and local jurisdictions and already caused layoffs, furloughs, hiring freezes, pay reductions and other severe measures that will disrupt and distort the recruitment and retention of the highway maintenance workforce and likely last for several years.

Q2 What is your current role within your organization?

- Winter Maintenance Manager
- Human Resources Manager
- Winter Maintenance Worker
- Winter Maintenance Private Contractor

End of Block: Introduction

Start of Block: State and Local Winter Maintenance Managers

State and Local Winter Maintenance Managers Survey

Q3 Respondent Information:

Title/Position: _____

Agency (including department/division/district)

Q4 Department Information:

Q5 Please provide information on the number of winter maintenance staff and vacancies in your unit at the beginning of the past season by category (please use winter 2019-2020 as the

baseline year) (Please put N/A into the not applicable box for any positions that are not applicable to your agency.):

	# Employed	# Vacancies	Not Applicable
Full-Time			
Part-Time, Year-Round			
Seasonal, Temporary Workers			
Contractors (using own vehicles/equipment)			
Auxiliary/Supplemental Workers from Other Divisions as Plow Truck Operators			

Q7 What is the official start and end dates of your winter operations season?

Start Date _____

End Date _____

Q8 What is the average annual snowfall?

Q9 What is the average number of snow/ice events requiring activation?

Q10 What is the population of your jurisdiction?

Q12 **Winter Operations:**

Q13 Total number of lane miles (if not readily available, please state center-line miles):

Q14 Is your agency responsible for public parking lots?

Yes

No

Q142 Is your agency responsible for rest areas?

- Yes
 - No
-

Q16 Regular snow duty shift arrangement:

- 8-Hour
 - 10-Hour
 - 12-Hour
 - 16-Hour
 - Other (please specify)
-

Q17 **Recruitment Strategies:**

Q18 Did your agency experience a shortage of winter maintenance workers in winter 2019-2020?

- Yes
 - No
-

Display This Question:

If Did your agency experience a shortage of winter maintenance workers in winter 2019-2020? = Yes

Q19 What was the approximate percentage of the shortage?

Q21 How much control do you have over recruitment processes (e.g. job posting language, selection of applicants for interviews, interview questions, salary offers, etc.)?

- Full Control
- Some Control
- No Control

Q22 What is the approximate length of time (in calendar days) to fill vacancies from initial requisition to offer of employment?

Q140 Does your agency provide training for new hires to obtain a CDL and/or upgrade a CDL?

- Yes
- No

Q23 What factors negatively affect your department's ability to recruit and hire winter maintenance staff? (check all that apply)

- Pay scale not competitive enough with private sector
 - Pay scale not competitive enough with other public sector jobs
 - Benefits package (health insurance, pension, etc.) not competitive
 - Work schedule (days/ hours) unfavorable
 - Difficulty finding candidates with requisite minimum skills/ experience levels
 - Physical and drug test pre-employment requirements
 - Background checks (criminal, civil, driving records)
 - Poor or unsuitable prior employment record
 - CDL requirement (pre-employment)
 - Routine job duties (too physical, boring, dirty, etc.)
 - Working conditions (poor facilities, equipment, exposure to hazardous materials, traffic, etc.)
 - Snow duty (shifts/ duty hours, standby restrictions, unpredictability, etc.)
 - Rigidity of position classification and job description system
 - Lack of career development, advancement opportunities
 - Poor perception of the job
 - Hiring process too slow, cumbersome
 - I do not know
 - Other (please specify)
-

Q24 What methods does your agency use to attract job applicants?

Q25 What are the most effective/successful recruitment strategies used in your agency?

Q26 What would you like to do differently to attract good candidates?

Q27 Retention Strategies:

Q28 How much difficulty does your agency have in retaining roadway maintenance workers?

- None
 - Some
 - Significant Amount
-

Q29 Does your agency conduct exit interviews?

- Yes
- No
- I do not know

Display This Question:

If Does your agency conduct exit interviews? = Yes

Q38 Who conducts the exit interview? (manager, supervisor, HR, etc.)

Display This Question:

If Does your agency conduct exit interviews? = Yes

Q30 Which questions from your exit interview have you found to be most helpful/insightful?

Q31 Besides retirement, what are the reasons why your workers are leaving? (check all that apply)

- Don't know
 - Career change (outside of organization)
 - Job change (within organization)
 - Competition from private sector for similar jobs/work
 - Competition from public sector for similar jobs/work
 - Relocation
 - Health and/or family issues
 - Dissatisfaction/job stress
 - Workplace culture/leadership issues
 - Lack of professional development/training
 - Lack of opportunities for promotion/career progression/advancement
 - Compensation/benefits
 - Termination for poor performance/accidents/traffic violations, etc.
 - Failure to maintain CDL/DOT
 - Other (please specify)
-

Q32 Does your agency use any of the following retention strategies? (check all that apply)

- Employee recognition and/or service year awards
- Merit-based pay raises
- Retention bonuses
- Education/tuition reimbursement (for GED, AA, BA/BS)
- Certificate/Certification courses offered by recognized organizations (LTAPs, APWA, IMSA)
- Cross-training/job enhancement
- Attendance at regional/national conferences (APWA, IMSA)
- Mentor/Mentee programs
- Promotions/Succession planning/Career ladders
- Contract to stay a certain length of time after receiving training, such as CDL training
- Other (please specify)

Q33 What are the most effective/successful retention strategies used in your agency?

Q141 Does your agency pay for CDL renewal?

- Yes
- No

Q34 What would you like to do differently to retain good workers?

Q35 Does your agency do anything else related to recruitment and retention of employees that has not been previously mentioned in this survey that you feel would be of interest?

End of Block: State and Local Winter Maintenance Managers

Start of Block: Human Resources Managers
Human Resource Managers Survey

Q39 Respondent Information:

Title/Position _____

Agency (department/division/district)

Q40 Workforce Information:

Q41 Please indicate the number of highway maintenance workers your agency employed last year in each of the following categories:

Full-Time, Permanent _____

Part-Time, Year-Round _____

Seasonal/Temporary (Winter Season) Workers

Auxiliary/Supplemental Workers from Other Divisions Used as Plow Truck Operators

Q42 Did your agency experience a shortage of highway maintenance workers in winter season 2019-2020?

Yes

No

Display This Question:

Did your agency experience a shortage of highway maintenance workers in winter season 2019-2020?

Q43 What was the approximate number of the shortage?

Q44 Do you hire highway maintenance workers without CDLs?

Yes (please explain your hiring policy related to CDL):

No (please explain your hiring policy related to CDL):

Display This Question:

Do you hire highway maintenance workers without CDLs? = If Yes (please explain your hiring policy related to CDL):

Q45 Do you help staff acquire CDLs?

Yes

No

Q46 Beginning with entry level workers and ending with management positions, please list job classifications for staff directly, or substantially, responsible for performing highway

maintenance activities in your agency as well as the minimum maximum pay ranges and the respective number of workers employed in each classification during winter 2019-2020.

	Job Classification/Title	Pay Range (Hourly Rate)	Total Authorized Positions in this Classification	% of Employees in this Classification that are Maxed Out in their Pay Scale
Position 1				
Position 2				
Position 3				
Position 4				
Position 5				

Q47 What is the average vacancy duration (in calendar days) in your agency (i.e. the time to fill a vacancy from job posting to job offer)?

Q48 How many unfilled highway maintenance worker vacancies did your agency have over winter 2019-2020?

Q49 Are your highway maintenance workers unionized?

Yes

No

Q50 What percentage of your highway maintenance workers are eligible to retire within the next 5 years?

Q51 What types of benefits does your agency provide to full-time, permanent highway maintenance workers? (check all that apply)

- Paid Time Off (PTO)
 - Paid vacation leave
 - Paid sick leave
 - Paid Holidays
 - Other (please specify)
-

- State or other public pension plan
 - Employer-matched deferred compensation
 - Deferred compensation without match
 - Other (please specify)
-

- Medical
- Dental
- Life
- Eye care
- Long-term care
- Comp time
- Flex time
- Call-in minimum pay
- Snow duty bonus

- Over time
- Double over time
- Stand by pay
- Holiday pay
- Shift differential
- Special duty or work out-of-class pay
- Health savings account
- Payroll savings plan
- Wellness exams
- Transportation subsidy for commute
- Deferred compensation program
- Bereavement leave
- Military leave, paid
- Meal reimbursements/meal provided
- Work clothing/uniforms
- PPE provided
- Reimbursement for CDL
- Tuition reimbursement
- Paid attendance at professional conferences/events
- Paid training for certifications/certificates/CEUs

Other (please specify)

Q52 Are these benefits available to: (check all that apply)

Only full-time permanent staff

Part-time (working at least 30 hours per week)

Part-time working at least 20 hours per week

Seasonal hires

Q53 **Recruitment Strategies:**

Q54 How are employment opportunities posted? (check all that apply)

- Social Media
 - Newspaper
 - Employment Websites (Indeed, LinkedIn, etc.)
 - Agency Website
 - State Website
 - Job Fairs
 - Word of Mouth
 - Headhunters
 - Workforce Service Agencies
 - Unions
 - Other (please specify)
-

Q55 Does your agency use any of the following recruitment strategies? (check all that apply)

- Recruitment Bonuses
- Marketing of employee benefits programs
- Marketing of on-the-job education/training/up-skilling opportunities
- Marketing of career ladder/career advancement opportunities
- Positive messaging regarding work and/or work-place culture
- Other (please specify)

Q56 Which recruitment strategies have been successful and why?

Q57 Does your agency specifically focus on recruiting any of the following groups? (check all that apply)

- High school graduates
- College or technical school attendees / apprenticeship program participants
- Second career (persons wanting to change careers)
- Military veterans
- Retirees
- Women
- Minorities
- Underserved populations (inner-city areas, low income)
- Current inmates that are about ready to be released
- Other (please specify)

Q58 Please describe strategies and methods targeting any or all of the above and indicate whether they have been successful or unsuccessful.

Q60 Please explain how you have changed your recruitment efforts in the last 5 years and why.

Q62 Retention Strategies:

Q63 On a scale of 1 (none) to 5 (significant), how much difficulty does your agency have in retaining highway maintenance workers?

- 1 (none)
 - 2
 - 3
 - 4
 - 5 (significant)
-

Q64 Does your agency conduct exit interviews?

- Yes
 - No
-

Display This Question:

Does your agency conduct exit interviews?

Q65 Which questions from your exit interview have you found to be most helpful/insightful and least helpful/insightful?

Q66 Besides retirement, what are the reasons why workers are leaving? (check all that apply)

- Don't know
 - Career change (outside of organization)
 - Job change (within organization)
 - Competition from private sector for similar jobs/work
 - Competition from county, city, or other public sector agencies for similar jobs/work
 - Relocation
 - Health or family issues
 - Permanent disability
 - Dissatisfaction/job stress
 - Workplace culture/leadership issues
 - Lack of professional development/training
 - Lack of opportunities for promotion/career progression/advancement
 - Compensation/benefits
 - Substance abuse testing
 - US DOT/CDL physical failure
 - Loss of CDL due to traffic violations
 - Termination due to performance or behavioral issues
 - Other (please specify)
-

Q67 Does your agency use any of the following retention strategies? (check all that apply)

- Employee recognition and/or service year awards
- Merit-based pay raises
- Retention bonuses
- Education/tuition reimbursement (for GED, AA, BA/BS)
- Certificate/Certification courses offered by recognized organizations (LTAPs, APWA, IMSA)
- Cross-training/job enhancement
- Attendance at regional/national conferences (APWA, IMSA)
- Mentor/Mentee programs
- Promotions/Succession planning/Career ladders
- Other (please specify)

Q68 Please indicate any demographic groups that your agency has particular difficulty retaining.
(check all that apply)

- None
 - Age 30 and younger
 - Between the ages of 31 and 49
 - Age 50 and older
 - Women (all age groups)
 - Minorities
 - Other (please specify)
-

Q69 What are the most effective/successful retention strategies used in your agency?

Q70 Does your agency track any metrics related to employee retention? (check all that apply)

- Turnover
 - Tenure
 - Cost of turnover
 - First-year resignation and termination rate
 - Other (please specify)
-

Q71 Please explain how you have changed your retention efforts in the last 5 years and why.

Q73 What are your road blocks to changing your retention plan?

Q74 Does your agency do anything else related to recruitment and retention of employees that has not been previously mentioned in this survey that you feel would be of interest?

Q75 **COVID-19:**

Q76 Please describe how your agency/department has worked to address COVID-related issues. If possible, please provide any policy related to COVID measures including testing, masks, disinfecting, alternating shifts, etc. Policy can be emailed to Karalyn Clouser at karalyn.clouser@montana.edu.

Q77 Are you currently in a hiring freeze or undergoing layoffs, furloughs, reduction in hours, or pay cuts?

Yes

No

End of Block: Human Resources Managers

Start of Block: Winter Maintenance Workers
Winter Maintenance Workers Survey

Q81

Respondent Information:

What type of agency do you work for?

- Municipal
 - County
 - State DOT District
 - Other (please specify) _____
-

Q82 Job Title:

Q83 Is your coverage area:

- Rural
 - Urban
 - Combination of Rural and Urban
-

Q84 Age:

- 18-24
 - 25-32
 - 33-40
 - 41-47
 - 48-55
 - 56-62
 - 63-68
 - 68+
-

Q85 Gender:

- Male
 - Female
 - Prefer Not to Answer
-

Q86 Race/Ethnicity:

- Hispanic or Latino
- American Indian or Alaska Native
- Asian
- Black or African American
- Native Hawaiian or Other Pacific Islander
- White
- Some Other Race (please specify)

Prefer Not to Answer

Q87 Education:

- Non-High School Graduate
- High School Diploma/GED
- Some College
- Community College Certificate
- Associate's Degree
- Bachelor's Degree
- Union Apprenticeship
- Trade School
- Military Specialty School
- Professional Certification (please specify)

Other (please specify)

Q89 Do you have a commercial driver's license (CDL)?

- Yes
- No

Display This Question:

Do you have a commercial driver's license (CDL)?

Q90 What class of CDL do you have?

Class A

Class B

Class C

Display This Question:

Do you have a commercial driver's license (CDL)?

Q91 Did you obtain your CDL:

On your current job

Prior to employment

Q92 Have you served in the military or a volunteer program that grants you Federal hiring preference?

Yes

Yes, currently in service

No

Q93 How long have you been employed by your current organization?

Q94 How long have you held your current position?

Q95 Is this job a second (major change) or post-retirement career?

Yes

No

Q96 Have you been promoted/reclassified since originally hired?

Yes

No

Q97 Are you a member of a union?

Yes

No

Q98 How did you find your current job?

- Social Media
- Newspaper
- Employment Websites (Indeed, LinkedIn, etc.)
- Agency Website
- Job Fairs
- Word of Mouth
- Headhunter
- Workforce Service Center
- Unions
- Other (please specify) _____

Q99 What attracted you to roadway maintenance work? (check all that apply)

- Pay
 - Benefits (health insurance, vacation, sick leave, pension, etc.)
 - Job Security
 - Type of work (physical/outdoors, variety, etc.)
 - Opportunities for Career Growth
 - Work Schedule
 - Operating trucks/equipment/machinery
 - Get a CDL
 - Lack of other employment in my area
 - Pride in serving my community
 - Other (please specify)
-

Q100 What aspects of your position do you value or enjoy the most?

Q101 Have you received any of the following training or other opportunities in your current position? (check all that apply)

- Technical Training (develop new skills and knowledge)
 - CDL (either initially or to upgrade)
 - Safety Training
 - Promotion opportunities
 - Mentoring
 - Supervisory/Leadership Training
 - Other Training or Opportunities (please specify)
-

Q102 What training was most helpful for your current position?

Q103 Have you left a job/position in the transportation sector in the last 5 years?

- Yes
- No

Display This Question:

Have you left a job/position in the transportation sector in the last 5 years?

Q104 Please share the reason for your departure.

Q105 Have you returned to a job/position in the transportation sector in the last 5 years?

Yes

No

Display This Question:

Have you returned to a job/position in the transportation sector in the last 5 years?

Q106 Please share the reason for your return.

Q107 What do you like the most and least about your job?

Most: _____

Least: _____

Q108 Why do you stay in this job?

Q109 Other than retirement, what would cause you to leave your current organization? (check all that apply)

- Career change
 - Better pay/benefits elsewhere
 - Better working conditions/schedules
 - Personal or family issues
 - Start own business
 - Move to a different area
 - Win the lottery
 - Other (please specify)
-

Q110 Why do you think others leave employment with the agency? (check all that apply)

- Career change
 - Better pay/benefits elsewhere
 - Better working conditions/schedules
 - Personal or family issues
 - Start own business
 - Move to a different area
 - Win the lottery
 - Other (please specify)
-

Q111 What steps could your agency take to enhance your career satisfaction over the long term? (check all that apply)

- Professional Development Offerings (sponsored attendance at conference, special training)
 - Employee/Performance Recognition and Awards
 - Mentoring Opportunities
 - Career ladder/career mobility
 - Increased Communication and Relations between Supervisors and Workers
 - Merit/Performance-Based Raises
 - Change in leadership (upper managers and directors)
 - Improved workplace climate
 - Improved Facilities and Equipment
 - Increased workplace diversity
 - Increased flexibility/work-life balance
 - Increased pay
 - Improved benefits (retirement, health insurance, etc.)
 - Other (please specify)
-

Q112 Would you recommend employment at your current organization to a friend or family member?

- Yes
- Yes, but... (please explain) _____
- No, because (please explain) _____

Q113 Please share any thoughts or comments about your experience as a roadway/winter maintenance worker. Do you have any suggestions for increasing employee recruitment and retention? Or what would you do differently to attract and keep good workers in your agency?

End of Block: Winter Maintenance Workers

Start of Block: Private Contractors
Private Contractor Survey

Q116 Respondent Information:

- Title/Position: _____
 - Company Name: _____
 - Location (City, State): _____
-

Q117 What is the main business of your company (e.g. landscaping/mowing, paving construction, quarrying, utilities, etc.)?

Q118 What percentage of your business is contracted snow removal?

Q137 Do you contract with any of the following: (check all that apply)

- Municipal (town, city, regional authority)
 - County
 - State
-

Q119 Has your company experienced a shortage of qualified snow removal workers in the past 3 years?

Yes

No

Display This Question:

Has your company experienced a shortage of qualified snow removal workers in the past 3 years?

Q120 What percentage of your snow removal workforce do you need to fill?

Q121 Has your company lost business over the past 3 years due to a lack of qualified snow removal workers?

Yes

No

Q122 How many snow removal workers did you employ during the 2019-2020 winter season?

Employed Directly: _____

Sub-Contracted (operator and truck):

Q123 Approximately what percentage of snow removal workers are:

Full-Time, Permanent Staff: _____

Part-Time, Year-Round Staff: _____

Seasonal/Temporary: _____

Q124 What factors negatively affect your company's ability to recruit, hire, and retain snow removal workers? (check all that apply)

- Pay scale not competitive enough with other industries
- Benefits package (health insurance, pension, etc.) not competitive
- Competition with public and other private sector employers
- Work schedule (days/ hours) unfavorable
- Applicants lack requisite minimum skills/ experience levels
- Physical and drug test pre-employment requirements
- Background checks (criminal, civil, driving records)
- Poor or unsuitable prior employment record
- CDL requirement (pre-employment)
- Routine job duties considered undesirable
- Working conditions considered unfavorable (safety concerns, cold, etc.)
- Unpredictability/irregularity of snow duty (shifts/ hours, standby restrictions, etc.)
- Lack of career development, advancement opportunities
- Poor perception of the job
- Hiring process too slow, cumbersome
- Employee unable to renew CDL or DOT card due to chronic medical condition
- Dismissal due to unsatisfactory performance, accidents, traffic violations, etc.
- Relocations

Other (please specify)

Q125 What is the hourly wage range for an entry-level snow removal worker in your company?

Q126 What successful strategies has your company used to attract job applicants?

Q127 Have you tried recruitment strategies that you found to be unsuccessful?

Yes

No

Display This Question:

Have you tried recruitment strategies that you found to be unsuccessful?

Q128 Please describe the recruitment strategies that you found to be unsuccessful.

Q129 How much difficulty does your agency have in retaining snow removal workers?

None

Some

Significant Amount

Q130 What are the reasons for employees leaving? (check all that apply)

- Retirement
 - Relocation
 - Unable to obtain/ renew CDL
 - Career change
 - Better pay/ benefits
 - Failed Alcohol or drug testing
 - Personal or family issues
 - Disability
 - Lack of advancement
 - Termination for unsatisfactory performance/ absenteeism
 - Other (please specify)
-

Q131 Does your agency conduct exit interviews?

Yes

No

Display This Question:

Does your agency conduct exit interviews?

Q132 What questions/responses for your exit interviews have you found to be most helpful/insightful?

Q133 What factors contribute to your company's ability to retain snow removal workers?

Q134 What would you like to do differently to retain good workers?

End of Block: Private Contractors

Start of Block: Follow Up
Follow Up (All Respondents)

Q138 May we contact you with follow up questions?

Yes

No

Display This Question:

May we contact you with follow up questions?

Q139 Please provide the following contact information:

Name: _____

Email Address: _____

Phone Number: _____

APPENDIX D – SUPPLEMENTAL INFORMATION FROM INTERVIEWS
Dubuque Apprenticeship Education Outline

WORK PROCESSES
MAINTENANCE TECHNICIAN, MUNICIPAL/(Public Works, Utility Worker)
(ROADWAY TECHNICIAN)

ONET/SOC CODE: 47-2061.00 RAPIDS CODE: 1049

Description: Maintain highway, municipal and rural roads, airport runways, and other rights-of-way. Responsible for repair to road base materials, concrete forming and finishing, utilizing various asphalt mixes and equipment, and road drainage systems. Duties include patching small and large sections of broken or eroded pavement, installing and repairing guard rails, installing pavement markings, utilizing medium duty maintenance equipment, repair and maintenance of drainage catch basins, swales, and erosion control. May also mow or clear brush from along roads, complete snow and ice control, or sweep streets with mechanical sweeping equipment. Must understand and be able to utilize maps, grade stakes, surveys, and DOT road standard documents. Must be familiar with work zone safety, flagging, and safety standards applicable to road maintenance.

These duties will be performed within road Right-of-Way (streets and sidewalks), parking lots, and walkways.

APPROXIMATE HOURS

A. GENERAL KNOWLEDGE AND WORK SKILLS	250
Applicable to All Areas	
1. Health and Safety	
2. Driving Safety	
3. Environmental Protection	
4. Surveying Principals	
5. Plan Reading, Quantity Take Off	
6. Communication Skills	
7. Customer Relations	
8. Hand Tool Operation and Maintenance	
9. Emergency/Disaster Clean Up	
10. Mobile Asset Management	
11. Confined Space Awareness	
B. ASPHALT MAINTENANCE AND REPAIR	1000
1. Application	
2. Rolling	
3. Tamping	
C. CONCRETE MAINTENANCE AND REPAIR	1000
1. Forming	
2. Base Compaction	
3. Mixing	
4. Placing/Pouring	
5. Finishing	

**MAINTENANCE TECHNICIAN, MUNICIPAL/(Public Works, Utility Worker)
(ROADWAY TECHNICIAN)**

ONET/SOC CODE: 47-2061.00 RAPIDS CODE: 1049

D. USE OF EQUIPMENT 1000

1. Light Duty Equipment Operation.

- a. Operates gasoline, diesel, and electric powered equipment such as walk-behind rollers, jack hammer/air compressor, trenchers, pumps, oxy-acetylene torch, vibratory compactors, chain saw, chipper/stump grinder, concrete/asphalt saws, circular saw, generator, lawn mowers, portable cement mixer, hand tools, and other similar equipment.

- b. **General Duty Equipment Operation.** Operates equipment such as dump trucks, flatbed trucks, skid steer loaders, forklift, water truck, tack truck, small roadway materials reclaimer, paving equipment, tractor operation (pull behind mowers, box blade, slope mower), pavement rollers, bucket truck, and other related equipment.

- c. **Introduction to Heavy Equipment.** Recognize and understand operation of heavy equipment such as motor-grader; excavator; bucket loaders, bulldozers, backhoes, and other similar heavy equipment.

E. RIGHT-OF-WAY MAINTENANCE 500

- 1. Site Cleaning
- 2. Landscaping
 - a. Brush
 - i. Trimming
 - ii. Removal
 - b. Ground Cover- Restoration
 - i. Compaction
 - ii. Leveling
 - iii. Sodding
 - iv. Seeding
- 3. Mowing
- 4. Maintenance

Prepares site for landscaping. Plants and mulches landscape vegetation. Waters, fertilizes, and trims plants and trees. Trims and removes tree branches obstructing pedestrian or vehicular traffic or signage. Operates edgers, clippers, trimmers, mowers, sod cutters, and various hand tools.

F. SNOW AND ICE CONTROL OPERATIONS 250

- 1. Anti-Icing
- 2. De-icing
- 3. Snow Plowing
- 4. Snow Removal

TOTAL HOURS 4000

Ohio DOT CMTP Program Materials

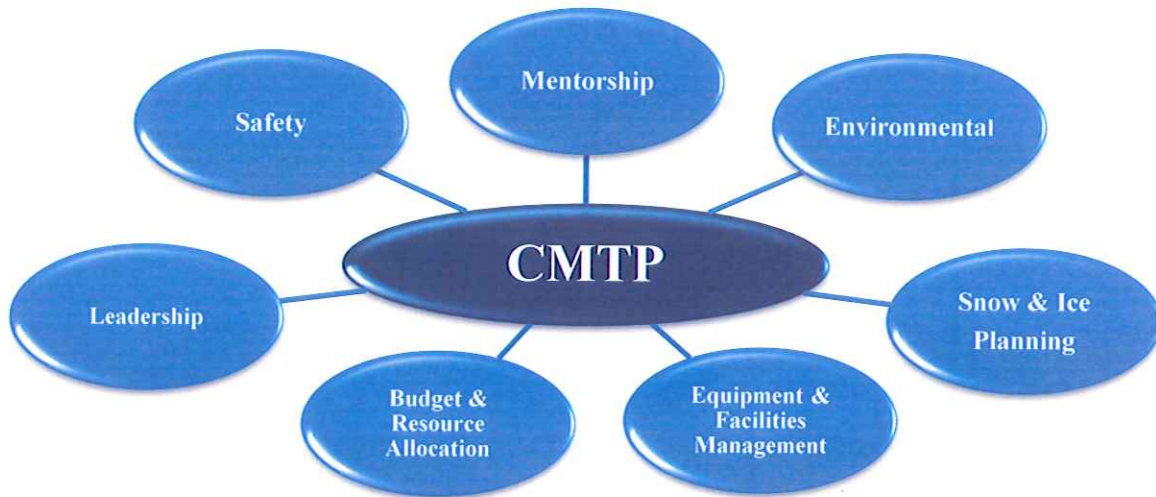
CMTP Program Brochure

CMTP Mission Statement

2018 CMTP Course Schedule

How I Want to be Coached & Mentored Form

County Management Training Program



Purpose: The County Management Training Program (CMTP) is designed to bridge knowledge gaps that occur when a new or newly promoted employee enters a county management position. The CMTP provides classroom instruction in core activities as well as field training exercises and experiences. The program's curriculum is built around objectives which are specific to the skills required of County Managers and Transportation Managers.

Process: The CMTP Program Manager and the District Highway Management Administrator select the participants. Prior to the start of the program, each participant meets with the Program Manager to discuss the program content and answer any questions. The participant must understand the commitment necessary to successfully complete the program, which includes group discussions, case studies, onsite activities, journaling exercises and participation in the Mentorship component.

Mentorship: A full-scale mentorship process is also included, which pairs a participant (mentee) with an experienced mentor from their District for the duration of the program. The mentor's role is to serve as a guide and coach to the new or newly-promoted managers. Following each CMTP course the mentor will meet with the mentee to discuss the training topic, relate the information to practical situations within the workplace, provide guidance and act as a post-course reviewer. This communication channel provides the mentee with a resource for addressing future questions or issues as they grow into their new role within ODOT.

Results: Upon completion on the CMTP the participants will have the expertise and competencies to maximize their performance in the role of county management. This will also provide ODOT with a highly efficient, well trained county management workforce ready to carry forward ODOT's mission and meet ODOT's critical success factors.

Office of Equipment Management

This course is designed to provide the key tools toward implementing proper equipment management. This knowledge will not only assist you in managing and maintaining your fleet, but provide you with a district and statewide view of benchmarking your fleet.

Risk & Liability

An overview of Ohio's ethics laws, right of way regulations, Court of Claims processes, tort liability, work rules and policies, internal investigations, vehicle accident reporting, self-insurance, and traffic control device uniformity as encountered in county operations issues.

Lean Six Sigma

Lean is a way of pursuing value in government by eliminating waste from daily processes and focusing on the customer. Lean is also a way to get results, improve workplace efficiencies and help reduce costs. This hands-on training experience will be helpful to all ODOT County Managers.

Snow & Ice Control Operations

Familiarizes the participant with Snow & Ice policies and regulations; ODOT's Snow & Ice SOP; material applications; brine application; Road and Weather Information System; snow and ice budget and resource allocation.

Special Hauling Permits

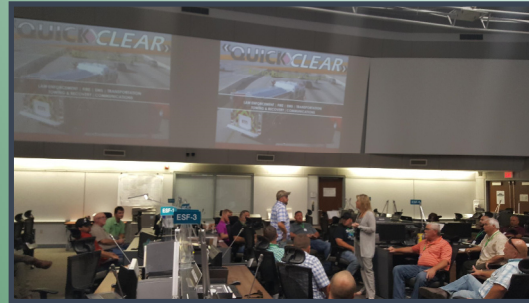
This course is designed to provide the participant with an overview of the requirements of moving an oversize/overweight vehicle or load under a Special Hauling Permit as they pertain to county operations.

Transportation Information

This course will give the participant an understanding of the services available by the Office of Technical Services. How to access and apply various informational tasks collected and maintained by the office; Traffic Data, Roadway Inventories, GIS Maps and tools, Digital Photolog, PathWeb application in management of county operations.

For more information on this program, contact:

Douglas W. McLaughlin, Program Manager
614-351-5547 Office Phone
614-348-4282 Cell Phone



Emergency Operations Center



Kevin Hodnett

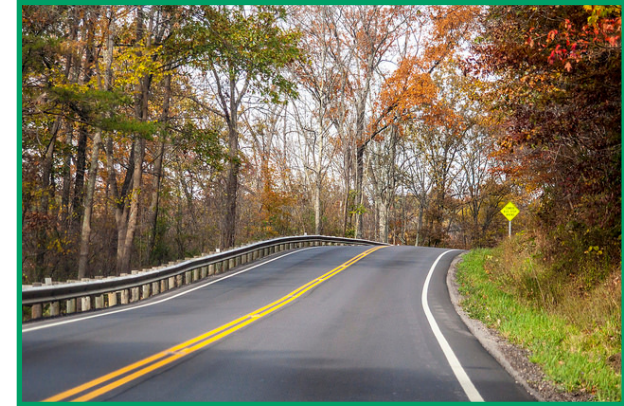


Class of 2017 with Mentors and Supervisors

Visit us on the web at:
<http://portal.dot.state.oh.us/Divisions/QualityHR/Training>



OHIO DEPARTMENT OF
TRANSPORTATION



County Management Training Program

2018



Office of Employee Development and Lean

WHAT IS IT?

The County Management Training Program was developed by the Office Employee Development & Lean in partnership with the Division of Highway Operations to bridge knowledge gaps that occur when new or newly promoted employees enter a County Management position.

WHAT IT OFFERS

Mentorship

Program participants will be assigned a mentor (the mentor may be a County Manager from within the District or a District Roadway Services Manager who has past experience as a County Manager), who will facilitate introductions to help build internal and external networks, answers questions, provide guidance and one-on-one training, and act as a post course reviewer.

Knowledge

Program courses will provide a variety of activities and discussions that will include round table discussions, case studies, and on-site activities. The program's curriculum is built around objectives that are specific to the skills required of County Managers.

First-Hand Experience

Through training activities, new County Managers (those with one year or less experience) will learn from the expertise and real-life experience of seasoned Transportation Managers.



PROGRAM OFFERINGS



After Action Reviews (AAR)

This course is designed to provide the participant with an After Action Review (AAR) process which can be used to capture lessons learned from past successes and failures, with the goal of improving future performances.

Diversity, Inclusion & Affirmative Action

This course is designed to provide the participant with an overview in the areas of Equal Opportunity so that the manager understands his/her responsibilities to ODOT and to his/her employees.

Emotional Intelligence (EI) Competencies

Keeping up-to-date with technical knowledge, skills and abilities is necessary in order to succeed in a job or profession. But what other qualities or characteristics are also important for achieving excellence and working productively with others? Gaining an awareness of E.I. competencies can assist managers in working and communicating more effectively with their team members and customers.

Environmental Issues

This course is designed to provide the participants with the business rules and laws encountered as a part of county management as related to maintenance and construction projects, garage housekeeping issues, and waste material handling, material storage, drainage and storm water management.

Facilities Management

Participants will learn the responsibilities associated with facility management, including land and buildings, fuel storage tanks, private water and sanitary systems, radio communications, janitorial services, and rest area facilities as they pertain to county operations.

Force Accounts Overview

An overview of the Force Account requirements. It will provide an explanation of why the Force Accounts limits were developed, what the project limits and requirements are and what work types are permitted under the force account rules. Participants will learn how to prepare a project estimate and create a work order.

Geotechnical Services

This course is designed to provide the participant with a working knowledge of services offered by the Office of Geotechnical Engineering. These services pertain to support of roadway and structures, geological hazards impacting the transportation network, and exploration and testing of geologic stratum.

Labor Relations in the Workforce

This course is designed to provide the participant with an understanding and appreciation for a positive Labor Relations culture in the work place and an overview of the major items of the current union contract and the impact on the staffing and operational needs in the work place.

Leadership Principles

This course is designed for managers wishing to improve their leadership skills. All employees wish to be led by an authentic leader, someone who is dynamic, transparent, competent and fair. The development of principles is designed to inspire leaders to further engage and inspire their employees.

Office of Emergency Management

This course will provide an overview of ODOT's emergency management procedures and their impact on county operations, including the location and function of the Emergency Management Agency (EMA).



2018	County Management Training Program			Season 9	(Statewide Enrollment)	Revised 6/14/2018
Training Dates	Name of Class	Class Length	Instructor/SME	Instructor Contact Info	Notes	
May 8 Tuesday	Touchstone Training Day Emotional Intelligence Mentor/Mentee Event	8:30am to 11:30pm	Tom Corey Mike Fitch	Mike 614-387-7358 Doug 614-351-5547	This session highlights the 12 competencies of the Emotional & Social Intelligence Model, which is the result of more than 40 years of research in the behavioral and social sciences. Gaining an awareness of E.I. competencies can assist managers in working and communicating more effectively with their team members and customers.	
May 8 Tuesday	Geotechnical Services	12:30pm to 3:00pm	Phillip Painter	Painter 614-351-2868	This course is designed to provide the participant with a working knowledge of services offered by the Office of Geotechnical Engineering. These services pertain to support of roadway and structures, geological hazards impacting the transportation network, and exploration and testing of geologic stratum.	
May 15 Tuesday Morning	Risk &Liability Management	8:30am to 11:30pm	Patrica Mobley Ed Waters	Patrica 614-466-2728 Ed 614-752-6907	Court of Claims processes, Tort liability, work rules and policies, internal investigations, vehicle accident reporting and self-insurance.	
May 15 Tuesday Afternoon	Diversity, Inclusion & Affirmative Action	12:30pm to 3:00pm	Robin Fogt Darrell Davis	Robin 614-466-7708 Davis 614-387-0393	This course is designed to provide the participant with an overview in the areas of Equal Opportunity so that the manager understands his/her responsibilities to ODOT and to his/her employees.	
May 22 Tuesday Morning	Labor Relations in the Workforce	8:30am to 11:30am	John Tornes	John 614-466-1916	This course is designed to provide the participant with an understanding and appreciation for a positive Labor Relations culture in the work place and an overview of the major items of the current union contract and it impact on the staffing and operational needs in the work place.	
May 22 Tuesday Afternoon	Special Hauling Permits	12:30am to 3:00pm	Mike Moreland	Mike 614-351-5530	This course is designed to provide the participant with an overview of the requirements of moving an Oversize/Overweight vehicle or load under a Special Hauling Permit as they pertain to county operations.	
June 5 Tuesday Morning	Leadership Principles	8:30am to 11:30am	Megan Gump Joe Phillips	Joe 614-752-5713 Megan 614-466-3384	This course is designed for leaders wishing to improve their leadership skills. All employees wish to be led by an authentic leader, someone who is dynamic, transparent, competent and fair. Development of principles designed to inspire leaders in order to further engage and inspire their employees	
June 5 Tuesday Afternoon	After Action Review	12:30pm to 3:00pm	Scott Lucas	Lucas 614- 644-6603	Course provides the participant with an After Action Review process which can be used to capture lessons learned from past successes and failures, with the goal of improving future performance.	
June 12 Tuesday	Snow and Ice Control Operations	8:00am to 3:00pm	Scott Lucas, Tim Boyer & Joe Phillips	Boyer 614-752-5732 Lucas 614-644-6603	Course is designed to provide participants with a sound understanding and a thorough review regarding the development, implementation, and evaluation of minimum requirements associated with snow and ice control measures as related to planning, operations, and performance evaluation.	
June 19 Tuesday	TSMO Presentation & Sign Shop Tour	9:00am to 12:30pm	John Macadam Dominic DelCol	John Macadam 614-752-9695	Provide participants with an overview of TSMO-Transportation Systems Management and Operations. Upon completion of this course participants will be familiar with TSMO from the County Manager perspective and in relation to county operations	
June 26 Tuesday Morning	Facilities Management	8:30am to 11:30am	Carrie Yost Tim Brunney	Carrie 614-752-6401	Responsibilities associated with facility management, including land and buildings, fuel storage tanks, private water and sanitary systems, radio communications as they pertain to county operations.	
June 26 Tuesday Afternoon	Force Account Overview	12:30pm to 3:00pm	Jim Cook	Jim 614- 644-6662	Participants will learn how to prepare a project estimate and create a work order. Participants will also learn what information and justification is required by the State of Ohio Auditor when project estimates and force account limits are exceeded.	

Training Dates	Name of Class	Class Length	Instructor/SME	Instructor Contact Info	Notes
July 18 Tuesday	Open Date	No CMTP			
July 31 Tuesday	Transportation Information (Technical Services)	8:30am to 3:00pm	Brian Schleppi Ian Kidner Dave Gardner	Brian 614-752-5745	This course is designed to provide the participant with an understanding of the services available and provided by the Office of Technical Services. In addition, how to access and apply various informational tasks collected and maintained by the office: Traffic Data, Roadway Inventory, GIS Maps and Tools, and Digital Photolog, in management of county operations.
August 7 Tuesday	Open Date	No CMTP			
August 14 Tuesday	Office of Employee Development & Lean 6 Sigma	8:30am to 3:00pm	Meghan Altier	Meghan 740-833-8380	This course focuses on the practical and applied aspects of using Lean tools and techniques. Participants will gain an understanding of the broad concepts of Lean and how they can use these tools to make positive changes in their work environments. Participants will have an opportunity to actively participate and provide feedback throughout the day. This hands-on training experience will be helpful to all ODOT County Managers.
August 21 Tuesday	Office of Equipment Management	8:30am to 3:00pm	Doug Burke, Tom Justus, J.P. Williams Sam Morrison	Doug Burke 614-351-2836	This course is designed to provide the participant with an overview of the responsibilities associated with equipment accrual, maintenance, and allocation and training.
August 28 Tuesday	Environmental Issues with Afternoon Tour	8:30am to 3:00pm	Matt Perlik Juliet Denniss	Matt 614-466-1937 Juliet 614-466-7880	Covers rules, regulations, and laws related to hazardous and waste material handling, material storage, drainage, and storm water management. Field Trip to Grovecity Outpost Garage
Sept. 11 Tuesday	Emergency Management	8:30am to 3:00pm	Leslie Bricker Carl Merckle	Bricker 614-752-6936	Emergency Procedures associated with floods, tornados, terrorist attack, bomb threats, fire, and emergency evacuation. 2855 West Dublin Granville Road
Sept. 26 Tuesday	Open Date	No CMTP			
October 9 Tuesday	Capstone Event Working with Other Generations Mentor/Mentee Event	8:30am to 12:00pm	Doug / Corey/ Mike Fitch 1.5 hr. Presentation Noon – Graduate / Pics	Mike 614-387-7358	This course reviews the trends and events that have tended to influence each generation, and provides insights into the different work habits, values and motivational factors that may be encountered by ODOT County Management personnel.

How I Want To Be Coached & Mentored

County Management Training Program - 2017



Name: _____ District & County: _____

Your Mentor's Name: _____

This worksheet will help you clarify your needs and expectations from your coaching opportunity while a participant in CMTP. A copy of this will be provided to your Mentor because the more clarity they have about your learning needs, the better the chance for a productive, enjoyable and growing experience.

I have been a full-time ODOT employee for 6 years.

In a word, the one thing I most need from a mentor is: Experience

Explain:

Only having 6 years at ODOT, experience is what is important to me.

Many things motivate me, but my personal three are:

(Example 1: Opportunities to take the lead)

(Example 2: Developing new skills)

1. My devotion to my Family
2. My need for "more"
3. other ~~option~~ opinion

If you mentor me, you can realistically expect me to:

Be direct

In turn, I expect my mentor to:

Direct Back

The following professional goals are important to me:

1) Learning how to listen to others better

I have the following strengths to help me achieve my goals:

Never give up attitude

I could use improvement in the following areas to further help me achieve my goals:

listen then React

Mentors can enhance my performance as well as my progress toward goal achievement in the following ways:

Be Patient

Lastly, I think you ought to know that:

Michigan is going to beat Ohio State... Next season

North Dakota DOT Recruitment Packet & Leadership Program Power Point

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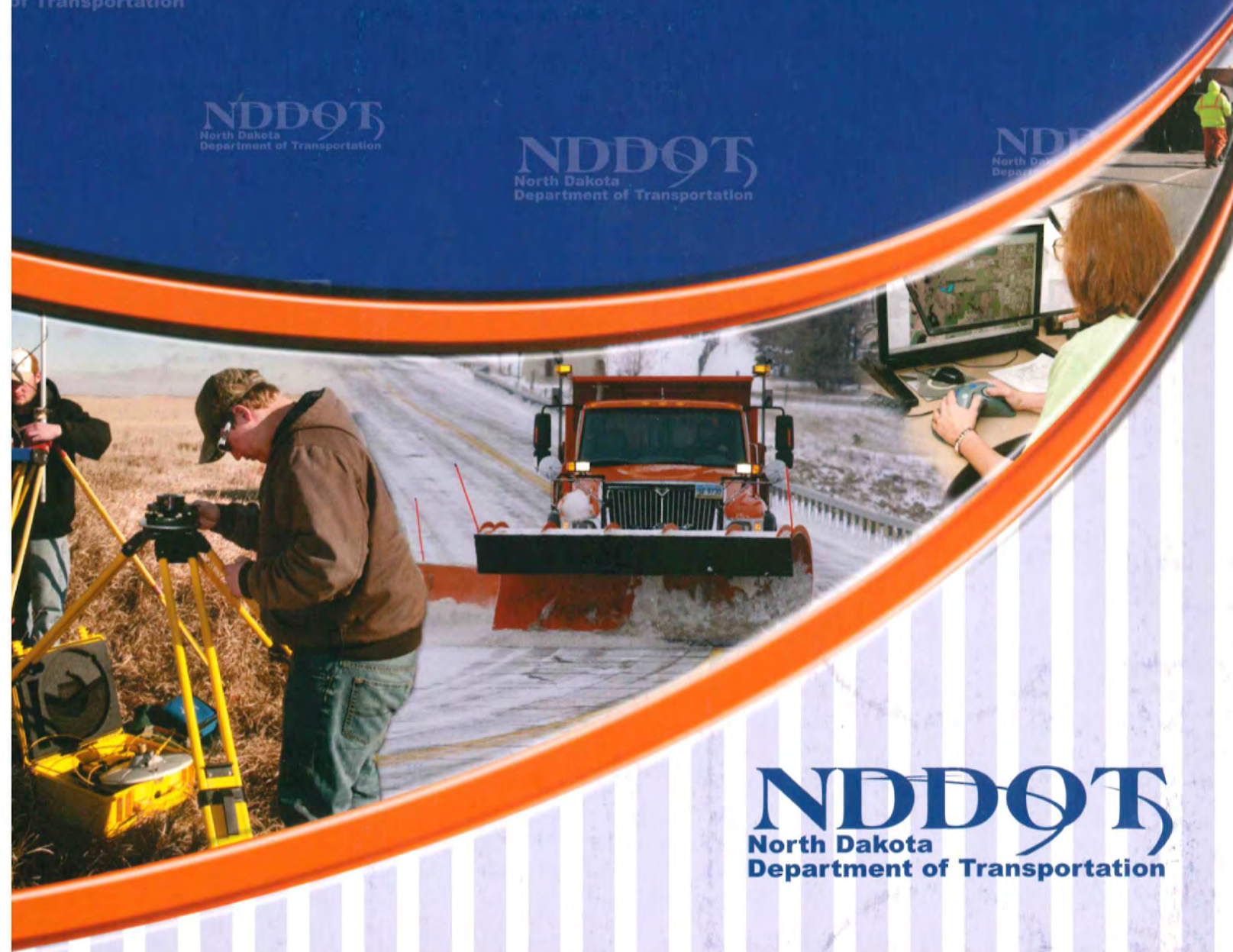
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APPLICANT GUIDE

Before you apply

- 1. Prepare your resume and cover letter.
- 2. Update your contact information.
- 3. Upload your resume and cover letter.
- 4. Print and sign your application.
- 5. Click on the "Apply" button.



Create Job Alerts

1. Access the State of North Dakota employment website.
https://www.cnd.nd.gov/psc/recruit/EMPLOYEE/HRMS/c/HRS_HRAM_FL.HRS.CG_SEA_H_FL.GBL?FOCUS=Applicant&SiteId=110

Initially, select New User in order to register. Then select Sign in.

VISION ZERO

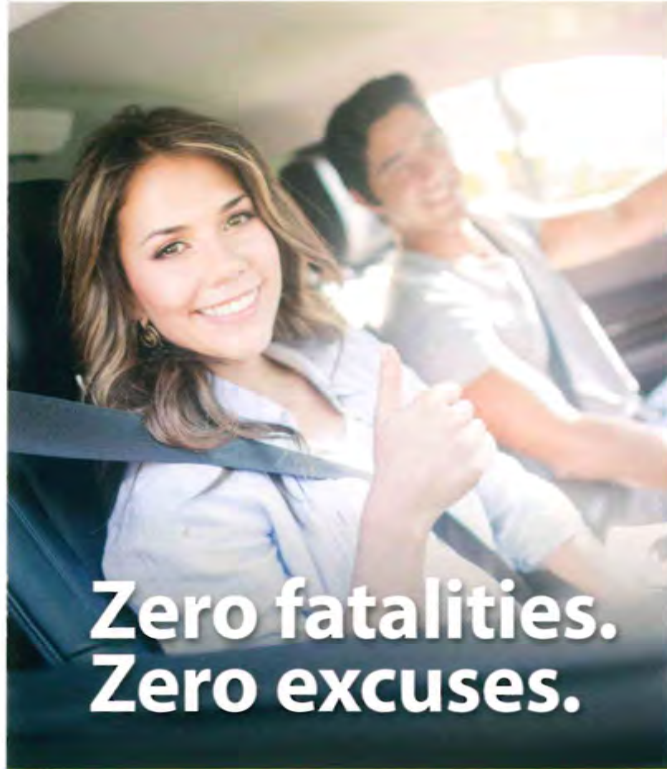


Application

- Provide your contact information.
- Fill in your personal information.
- **DO NOT** attach any documents.



VISION ZERO



**Zero fatalities.
Zero excuses.**

94% of motor vehicle crashes are caused by human error. That means they're preventable by human action. It's your responsibility to make the right choices to achieve the Vision Zero goal of zero fatalities and serious injuries on North Dakota roads.

What you can do to achieve Vision Zero:

- Use seat belts and proper child restraints
- Drive sober
- Drive distraction free
- Obey the speed limits and all traffic laws

Every trip, every time.

VISION ZERO

Zero fatalities. Zero excuses.

is a multi-agency partnership working toward a goal of zero motor vehicle fatalities and serious injuries on North Dakota roads.



To find out more, visit VisionZero.ND.gov



Create Job Alerts

1. Access the State of North Dakota employment website.
https://www.cnd.nd.gov/psc/recruit/EMPLOYEE/HRMS/c/HRS_HRAM_FL.HRS_CG_SEARCH_FL.GBL?FOCUS=Applicant&SiteId=11000
2. Initially, select New User in order to register. Returning users select **Sign in**.
3. In the **Search Jobs** field enter a keyword to search for job you are looking for.
4. Click **Save Search**.
5. In the **Search Name** field enter name of search.
6. Select the **Email me when new jobs meet my criteria box**, current email should populate Email To field.
7. **Select Save**.
8. Maintain **My Job Alerts** from the main Welcome screen.



Exciting things are happening at the North Dakota Department of Transportation!

What's even more important, however, is that the highway system gives every resident access to the necessities of life: food, clothing, schools, medical care, and fire and rescue services.

At NDDOT, a thousand talented employees, located across the state, work together to make all this happen. When we go home at the end of the day, we've made the world a better place. And we've had fun doing it, with new technology, an employee-friendly workplace, and great coworkers.

Whether you're a recent graduate or an experienced professional considering a career move, you may find the perfect job at NDDOT.

Interested?

To find a list of available positions please visit: <https://www.dot.nd.gov>



All regular, full-time positions include the competitive state benefits package including: employer paid health insurance, retirement account, annual and sick leave, deferred compensation, life insurance, and optional dental, vision, life insurance, and FlexComp.



APPLICANT GUIDE

Before you apply:

Here are some items to consider before you begin the application process. When completing a State of ND employment application, please be aware of a 30 minute system inactivity time out notification. Although you are encouraged to attach a resume, the resume text does not automatically populate the application. Therefore, you must enter your information into the fields on the application as required. Here are some quick tips to help make your application experience positive:

1. **Temporarily turn off any pop up blockers.**
2. Watch for warning that says "I need more time" when 30 minutes is approaching. Click OK if your application is not complete.
3. Use the **Save as Draft** button, found in the three dots icon by the next button, after completing sections to prevent loss of data.
4. **Print** your application materials and the job posting for your records.
5. Click the **Submit Application** button to fully complete the application process.

Application Tips:

- Provide a complete and accurate detailed account of your past experience in the employment history sections of the application form on how your education, experience and skills will qualify you for this position.
- Fill in all information requested on the application form such as month/year of employment, summary of previous duties, etc. Incomplete sections will not be given credit and could ELIMINATE you from consideration.
- **DO NOT assume the screener knows you or your work.** We have to use only the information provided as part of the application documents to minimum qualify the applicants and determine eligibility.
- Be sure to add a new position for each of your positions at one employer regardless if it was a promotion to another position.
- Be sure to customize your resume and/or cover letter for each position.
- Be careful when using jargon, buzzwords, industry abbreviations/acronyms which may only be familiar to those in your occupation/industry. These words/phrases should be clearly defined so anyone can understand them. You may want to ask a friend or family member to review to see if there is something they do not understand.
- You or someone you know and trust should proof read/review your application for any errors.
- If this position is important to you, PLEASE take the time needed to properly prepare and submit a complete, accurate application. This includes having a cover letter, resume, transcripts, references, and any other requested information.
- When answering the requested questions provide detailed answers on how your past education or experience allows relates to the question. The more detailed your answer the more likely you are to get selected for additional consideration in the process.
- *NOTE: providing false information on an application is grounds for immediate elimination from the selection process.*

Create Job Alerts Notification Email:

1. Access the State of North Dakota Employment website at: <http://www.nd.gov/hrms/jobs/>
2. Initially, select **New User** in order to register. Returning users select **Sign in**.
3. In the **Search Jobs** field enter a keyword to search for jobs you are looking for.
4. Click **Save Search**.
5. In the **Search Name** field enter name of search.
6. Select the **Email me when new jobs meet my criteria box**, current email should populate Email To field.
7. **Select Save**.
8. Maintain **My Job Alerts** from the main Welcome screen.

About the NDDOT

Mission:

Safely move people and goods.

Vision:

North Dakota's Transportation Leader
Promoting Safe Ways
Superior Service
Economic Growth

Values:

PRIDE

Professionalism: Our employees strive to improve themselves and the products and services they deliver.

Respect: Our employees treat others courteously and are treated with courtesy by the Department.

Integrity: Our employees deal honestly with coworkers and with contacts outside the Department.

Dedication: Our employees assume responsibility for their work and do the job right the first time.

Excellence: Our employees continually exceed and raise the high standards they set for themselves.

Districts:

Bismarck District
218 South Airport Road
Bismarck, ND 58504-6003
(701) 328-6950

Dickinson District
1700 Third Avenue West, Suite 101
Dickinson, ND 58601-3009
(701) 227-6500

Grand Forks District
1951 North Washington
Grand Forks, ND 58208-3077
(701) 787-6500

Valley City District
1524 Eighth Avenue Southwest
Valley City, ND 58072-4200
(701) 845-8800

Devils Lake District
316 Sixth Street Southeast
Devils Lake, ND 58301-3628
(701) 665-5100

Fargo District
503 38th Street South
Fargo, ND 58103-1198
(701) 239-8900

Minot District
1305 Highway 2 Bypass East
Minot, ND 58701-7922
(701) 857-6925

Williston District
605 Dakota Parkway West
Williston, ND 58802-0698
(701) 774-2700

NDDOT Business Support Divisions

- **Audit Services:**
 - Responsible for performing and overseeing internal audit functions, such as an annual DOT inventory review, and reviews of District or other Department operations.
- **Communications:**
 - Responsible for disseminating information to NDDOT stakeholders: primarily to the general public; to local governments, civic groups, and other legislative bodies; and to its employees.
- **Financial Management:**
 - Responsible for the Department's accounting and reporting functions, budgeting, payroll, procurements, audits, revenue forecasting, central supply, cash management, and the disposal of highway equipment and materials.
- **Human Resources**
 - Provides staffing for the Department through the following: recruitment and selection, employment records, performance reviews, training, discipline, staffing plans, employment law compliance, workplace investigations, personnel policies, and payroll; and coordinates Department position classifications and salary plans.
- **Information Technology:**
 - Provides information systems services, computer/network services; photo, printing, and mail operations, information records management, technology training, and telecommunications/radio service.
- **Legal:**
 - Represents the Department in all legal matters with the public, contractors, and vendors, in addition to dealing with legislative and administrative rules.
- **State Fleet Services:**
 - Responsible for providing and managing fleet vehicles for all of the state agencies and universities of North Dakota; provide defensive driving course training for state employees; and are responsible for fuel management and the credit card program for vehicle fueling and repairs.

NDDOT Driver & Vehicle Services Divisions

- **Driver's License & Traffic Safety:**
 - Provides licensing and driver record management services for all North Dakota drivers.
- **Motor Vehicle:**
 - Administers all programs relating to the titling and registration of vehicles; regulates motor vehicle dealers, interstate motor carriers, mobility-impaired parking privileges, intrastate household goods carriers; and is responsible for maintaining and making available records created by its various activities.
- **Safety**
 - Develops, implements, and evaluates the effectiveness of programs designed to reduce crashes and related fatalities, injuries, and property damage.

NDDOT Engineering Divisions

- **Bridge:**
 - Performs the structural analysis and designs and prepares the plans for bridge projects on the state highway system; bridge inspection and management of North Dakota State bridges.
- **Civil Rights:**
 - Develops & administers 7 civil rights programs; Title VI, Title VII, Disadvantaged Business Enterprise (DBE), On-The-Job Training (OJT), DBE/OJT Supportive Services, Contract compliance, & Labor compliance.
- **Construction Services:**
 - Responsible for highway construction bid openings, contracts, bonds, and contract payments; provides services in contractor pre-qualifications, construction scheduling, engineering reviews, contractor claims, project staffing; and provide support to our Divisions and Districts as needed
- **Design:**
 - Responsible for preparing concept reports and plans for all highway construction projects in the state; lighting and signals, signing and pavement marking, guardrail, and safety and traffic reviews; utilizes the state's Skymaster aircraft and ZI Digital Mapping camera for capturing image data; collect preliminary survey data from the field; technical engineering related support for CADD programs; and analyzes the preliminary data and Public Land Survey System data to create right of way plats that show the property owned by the state for the state highway system or wetland mitigation for highway purposes.
- **Environmental & Transportation Services:**
 - Provides support and allied services necessary to carry out the project development activities within the Department through Environmental Services, Cultural Resource Services, Right of Way Services, Consultant Administration Services, and Technical Services.
- **Local Government:**
 - Administers, coordinates, and allocates funds for all county, urban, Transportation Enhancement, and transit federal aid programs and projects; provides a liaison between the Federal Highway Administration, county and city officials, and NDDOT divisions and districts during project development; assists local entities in getting their projects ready for the bid openings; and coordinates the Emergency Relief program on a statewide basis on behalf of the NDDOT.
- **Maintenance:**
 - Responsible for NDDOT property and facilities; safety, health, and emergency responses; non-project related Right-of-Way; budgeting for maintenance operations, capital improvements, maintenance equipment, pavement marking program, static traffic signs, maintenance specifications; the pavement preservation program; Roadway Weather Information System (RWIS); Intelligent Transportation Systems (ITS); and load restriction and road condition reports.
- **Materials & Research:**
 - Responsible for researching products and processes for use on construction projects; testing products and materials; provide pavement thickness design recommendations; collects soil samples for analysis; linear soils and deep foundation investigations; locate gravel sources; provide bituminous QC/QA/testing training, inspection of steel beams; and manages numerous contracts.
- **Planning/Asset Management**
 - Provides the highest quality information and analyses, in the most efficient and timely manner supported by the available resources by management and production of numerous cartographic products including static maps and data-query or analysis visual reports; management of all data systems used in the Division and to assist all division sections with the analysis, GIS display, and reporting of such data; collecting, analyzing, and distributing state highway pavement condition and profile data; developing and implementing the Governor's Statewide Long Range Transportation Plan, State Rail Plan, rail loan programs, rail crossing programs, annual state Planning and Research Program, special studies and reports, development of new programs, applying for discretionary grants; establishing and maintaining a network of contacts with other state and provincial DOTs, state, federal, tribal and local governments and agencies, and supporting the activities of other NDDOT Divisions; and develop, maintain, and implement the processes for collecting and forecasting traffic volumes, or more specifically providing a count of the number of vehicles using a roadway – also known as the Annual Average Daily Traffic (AADT).
- **Programming**
 - Responsible for coordinating the development of the Statewide Transportation Improvement Program, managing federal funds, implementing the Department's scoping process, and completing traffic operations activities to include a system wide perspective as well as project level involvement from early project inception through to project completion.

Benefit Information Sheet

There has never been a better time to consider a career with the North Dakota Department of Transportation. The State of North Dakota is flourishing, economic growth is setting new records, job opportunities are abound, and the NDDOT is at the forefront of this historic time in the State.

NDDOT service is inherently meaningful to all ND citizens because our work is related to building and improving communities, the State's infrastructure, and providing programs to safely move people and goods throughout North Dakota. Every day presents new challenges which provide our employees with a rich and rewarding professional career path filled with challenge, excitement, and tremendous growth opportunities.

The NDDOT provides a comprehensive benefits package, which significantly increases our total compensation package. These benefits include:

- Fully Paid Family Health Insurance
- Defined Benefit Retirement System
- Life Insurance
- Deferred Compensation
- FlexComp Plan
- Employee Assistance Program
- Annual Leave
- Sick Leave
- Holiday Pay – 10 paid holidays per year
- Leave Sharing Program
- Funeral Leave
- Military Leave

Employees can also take the following voluntary benefits:

- Vision Insurance
- Dental Insurance
- Additional Life Insurance
- Defined Contribution Retirement System
- High Deductible with a Health Savings Account

Along with these benefits, the NDDOT also offers:

- Promotional Opportunities
- Career Development Opportunities
- Training Library
- Tuition Reimbursement
- Organizational Wellness Program
- Employee Recognition Program
- Service Awards
- Flexible Scheduling
- Infant to Work Program
- Telecommuting

For more information about working for the NDDOT please visit: www.dot.nd.gov.

For more information about the North Dakota State Benefits package, please visit: www.nd.gov/hrms/jobs/benefits.aspx.

CAREER OPPORTUNITIES

At the State of North Dakota

At the State of ND, we are driven to succeed through gratitude, humility, curiosity and courage. We know that with hard work and perseverance, we can better our state and local communities. We have diverse career opportunities for you to explore.

- Administrative Services
- Educational Services
- Engineering & IT Services
- Fiscal Services
- Human Services
- Medical Services
- Natural Resources & Environmental Services
- Protective Services
- Trade Services
- Many More

At the State of ND, our purpose is to empower people, improve lives and inspire success. Our talented workforce is committed to providing exceptional services to the citizens of North Dakota. We make a difference, whether working to keep us safe, supporting the vulnerable, educating our future leaders, serving as responsible stewards of our resources, assisting with the public policy and everything in between!

Learn more at <https://www.nd.gov/government/state-government/agency-alphabet>

Achieve your career goals with the State of ND! Whether you are a recent graduate or experienced professional considering a career move, you may find the perfect fit at the State of ND.

The State of ND is full of opportunities to learn and grow. We offer mentoring, ongoing training, and professional development courses that encourage a growth mindset and leadership everywhere.



View all job openings at www.nd.gov/omb/jobs

NORTH
Dakota
Be Legendary.™

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Department of Transportation

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Knowledge Transfer

ND Dept. Of Transportation

Mission, Vision and Strategic Focus Areas Include:

- Safety
- Innovation
- Assets
- Mobility
- Leadership - We strive to position the NDDOT as a local, state, and nationally trusted leader. We value service, excellence and diversity, instilling a culture of leadership, which expands the problem-solving capacity of our organization.

▶..... How “Leadership” Became Strategy at NDDOT

NDDOT EMPLOYEES USE NEW PLATFORM TO SHARE IDEAS

By Peggy Anderson, NDDOT

The North Dakota Department of Transportation (NDDOT) is utilizing an ideation program to collect ideas from employees across the state. “This online, idea-forming tool is proving to be a great interactive way for employees to share ideas and provide input,” says Tom Sorel, NDDOT Director. NDDOT implemented the program in 2018 and decided to call it Innovation-JAM, or I-JAM. Team members helped design visual elements and various segments for the program, which uses a crowdsourcing platform.



“Our I-JAM strategic campaigns were a huge success,” says Sorel. “We had 656 members in our community which is a 70% participation rate among our employees.” The software provider reports that a typical rate of participation is 10% on most campaigns. During the initial launch of the program NDDOT had more than 107 ideas submitted with 721 comments and 4,500 votes accumulated on the various ideas.

ND Culture of Leadership and Learning



- Analyzed employee feedback. Identified desire to discover and utilize employee strengths to enhance learning, collaboration, innovation, and career opportunities.
- Designed and launched leadership development platform open to **ALL** employees.
- Reviewed available training. Created a “Learning Opportunities Menu” which categorized opportunities for participants.
- Reached out to **ALL** supervisors to increase support and participation. Held workshops to discuss roadblocks, benefits, and what supervisor role and expectation is.

ND Culture of Leadership and Learning



- Built on previous efforts to enhance learning and apply what was learned in our dynamic work environment and position us for the future of transportation.
- Adapted NDDOT efforts to reinforce alignment with State of ND purpose statement and cultural aspirations developed after launch.
- Participated on State of ND Leadership Steering Committee. Added new learning opportunities “coming soon” to menu.
- Now, we have a strong avenue for knowledge management practices (capture, flow, transfer, and prevents knowledge loss)....

Supervisor Workshop

Growth Mindset

- Belief that we can learn and grow despite challenges and obstacles.

Innovation

- Creativity
- Risk

Collaboration

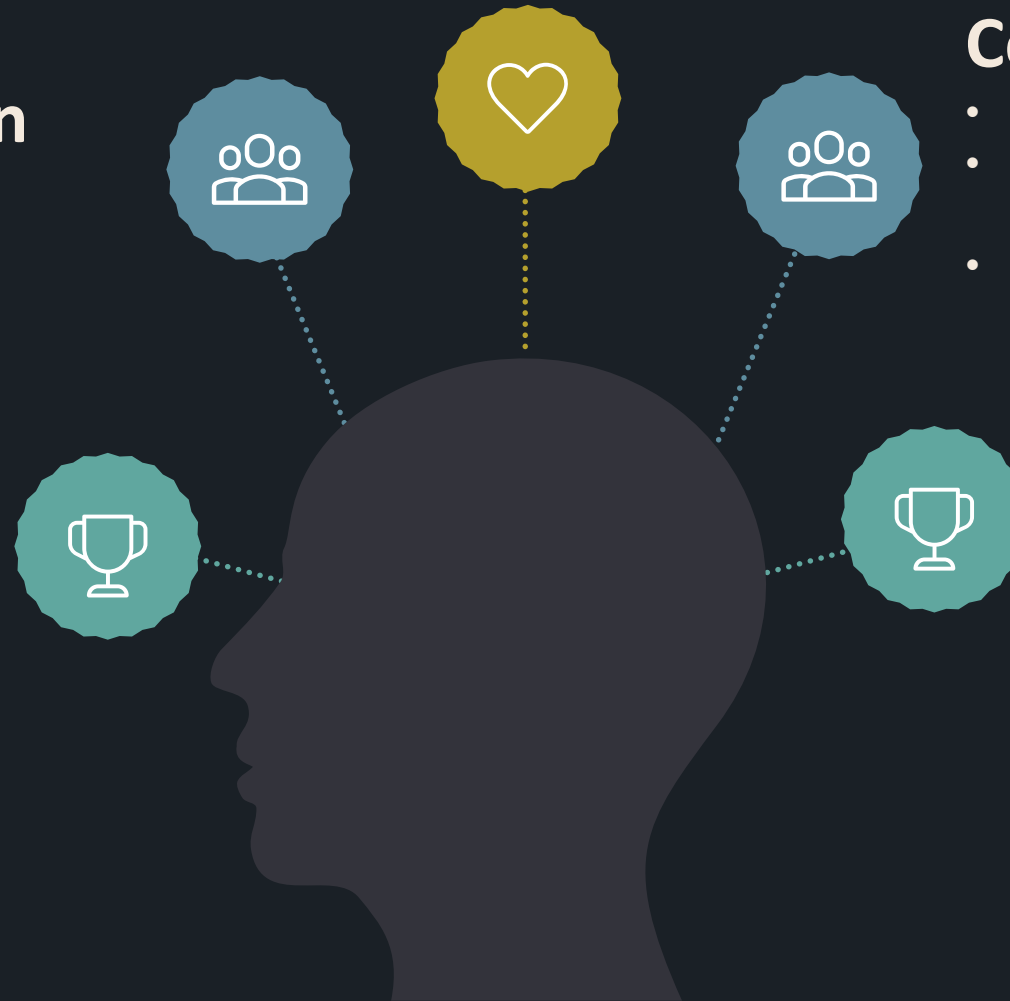
- Increased communication
- New ideas; new tools; new teams
- Makes work easier and fun!

Engagement

- Motivated
- Feel valued
- Passion
- High performers

Retention

- Commitment to department success



**EMPOWER PEOPLE
IMPROVE LIVES
INSPIRE SUCCESS**



..... Your DOT Leadership Development Journey

Discover. Opportunities. Transform.

01 : Open application periods. No deadlines. No set timeline for completion. Employee is in the driver's seat!

02
.....
Two types of applications to choose from participant or champion.

03
.....
Lanes based on competencies & level of leadership that matches participant goal(s)

05 :
Structure is flexible. Feedback for improvements is welcome. Share success stories. Ask questions!

04
.....
Need to identified specific competencies you or your employees want to improve on then choose learning opportunities.
Supervisors, HR and employee work together on this!

Application

DOT LEADERSHIP DEVELOPMENT JOURNEY PARTICIPANT APPLICATION
 North Dakota Department of Transportation, Human Resources
 SFN 54234 (2-2019)

Name		Date	
Job Title/Classification		Division / District	
Work Address		City	State ZIP Code
Work Telephone Number		Work Email Address	
Supervisor's Name		Supervisor's Title	

Description of current position or summary of duties and any past work related leadership roles held:

Why are you interested in starting your DOT leadership development journey?

Please check the specific competencies you are interested in developing:

<input type="checkbox"/> Accountability	<input type="checkbox"/> Flexibility	<input type="checkbox"/> PRIDE (Professionalism, Respect, Integrity, Dedication, Excellence)
<input type="checkbox"/> Communication	<input type="checkbox"/> Fiscal Resource Management	<input type="checkbox"/> Results Orientation
<input type="checkbox"/> Conflict Management	<input type="checkbox"/> Innovation	<input type="checkbox"/> Strategic Leadership
<input type="checkbox"/> Creativity	<input type="checkbox"/> Judgment & Decision Making	<input type="checkbox"/> Teaching Others
<input type="checkbox"/> Culture Awareness	<input type="checkbox"/> Leveraging Technology	<input type="checkbox"/> Team Leadership
<input type="checkbox"/> Customer Service	<input type="checkbox"/> Organizational Effectiveness	<input type="checkbox"/> Teamwork & Cooperation

Please check the types of learning opportunities you are interested in:

<input type="checkbox"/> Classroom Training Sessions	<input type="checkbox"/> Job Shadowing Participant	<input type="checkbox"/> Practical Application
<input type="checkbox"/> Committee Involvement	<input type="checkbox"/> Job Sharing Participant	<input type="checkbox"/> Role Play
<input type="checkbox"/> Group Discussions	<input type="checkbox"/> Mentee	<input type="checkbox"/> Self-study Courses
<input type="checkbox"/> Group Mentoring	<input type="checkbox"/> Mobility Assignments	<input type="checkbox"/> Statewide or stakeholder projects
<input type="checkbox"/> Lead Projects	<input type="checkbox"/> Online Learning	<input type="checkbox"/> Workshops
<input type="checkbox"/> Involvement in Professional Associations	<input type="checkbox"/> Panel Discussions	

SFN 54234 (2-2019)
 Page 2 of 2

Describe previous courses you've taken and/or any volunteer or committee work that helped you gain leadership competencies. List competencies.

Provide your initial thoughts on your leadership development goal.

Supervisor's Comments/Approval:

Supervisor's Signature	Date
------------------------	------

If accepted into the DOT Leadership Development Journey, I will be an active participant and fully committed to continuing my DOT Leadership Development Journey.

Applicant Signature	Date
---------------------	------

Please complete and return your application to:

NIKKI SACKMAN
 HR DIVISION DIRECTOR, NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
 608 EAST BOULEVARD AVE
 BISMARCK ND 58505-0700
 Phone: 701-328-4365 Fax: 701-328-1415 Email: nsackman@nd.gov

Applicants will be notified after the selection process is complete.

Competency Guide

Respect the Past; Prepare for the Future.

Our values of PRIDE (Professionalism, Respect, Integrity, Dedication and Excellence) will continue to be part of NDDOT as we prepare for the future. These values along with the following competencies are also positioning the department and our employees in their growth and preparing them for the future.

D Lane Competencies

Customer Service or Citizen Focus - Understand we have external and/or internal customers that we provide services and information to but we also honor all commitments to those customers by providing helpful, courteous, accessible, responsive, and knowledgeable service. In addition, as we move to the future, we will strive to deliver the best service, with the right balance between technology and citizen facing time. With simplification at the core; we listen, design, create and deliver with citizens at the center of our work.

Teamwork and Cooperation or Work as One - Cooperate with others to accomplish common goals; work with employees within and across his/her division/district to achieve shared goals; treat others with dignity and respect and maintain a friendly demeanor and value the contributions of others. We also understand that diverse teams working together across divisions and districts can bring all of the resources of our state to serve our citizens best. Being inclusive and sharing information provides a better outcome and is crucial to innovation.

Results Orientation or Make a Difference - Consistently deliver required business results; set achievable, yet aggressive goals; consistently comply with quality standards and meet deadlines; maintain focus on department and State goals. As we move to the future, we will also focus on the impact of each activity, program and interaction using data and analytics to identify priorities and measure outcomes. We will continually strive for improvement and impact!

Accountability or Leadership Everywhere - Accept full responsibility for self and contribution as a team member; display honesty and truthfulness; confront problems quickly; display a strong commitment to organizational success and inspire others to commit to goals; demonstrate a commitment to delivering on his/her public duty and presenting oneself as a credible representative of the department and state to maintain the public's trust. We also will lead by example, promote team spirit and hold ourselves and others accountable. We will have gratitude, empower each other and view failures as learning opportunities. We acknowledge that we are humble, transparent, focused, and trustworthy.

Judgment and Decision Making or Growth Mindset - Analyze problems by evaluating available information and resources; develop effective, viable solutions to problems which can help drive the effectiveness of the department and/or State of North Dakota. We can be curious. We can learn from each other, finding the genius in what has been done, eager to improve upon it. We will support one another to have courage to take risks and apply the learning as we move ahead.

Communication - Respectfully listen to others to gain a full understanding of issues; comprehend written material; present information in a clear and concise manner orally and in writing to ensure others understand his/her ideas; appropriately adapt his/her message, style, and tone to accommodate a variety of audiences.

Creativity and Innovation - Apply creative problem-solving skills to develop solutions to problems; recognize and demonstrate the value in taking "smart" risks and learning from mistakes; develop multiple alternatives and understand the feasibility of each; effectively share and implement ideas.

O Lane Competencies

Team Leadership - Effectively manage and guide group efforts; track team progress, adequately anticipate roadblocks and change course as needed to achieve team goals; provide appropriate feedback concerning group and individual performance including areas of improvement.

Conflict Management - Address conflict by focusing on the issue at hand to develop effective solutions when disputes or disagreements occur; we help others resolve conflict by providing impartial mediation as needed. We listen.

Flexibility - Adapt to change and different ways of doing things quickly and positively; we do not shy away from addressing setbacks or ambiguity; we deal effectively with a variety of people and situations; we appropriately adapt our thinking or approach as the situation changes.

T Lanes Competencies

Organizational Effectiveness - Develop innovative approaches to address problems and drive continuous improvement; drive effective and smooth change initiatives across the department by communicating, confirming understanding, and actively working with stakeholders to provide value when met with resistance.

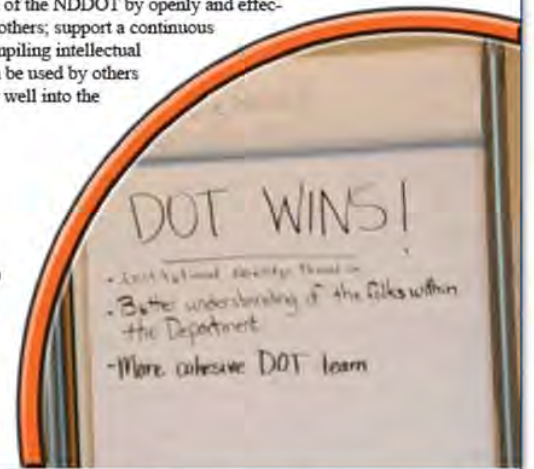
Leveraging Technology - Recognize the impact of technological advances and are willing to integrate technology in performing tasks to achieve efficiency, quality and productivity.

Fiscal Resource Management - Plan, allocate, spend and manage monetary resources responsibly.

Cultural Awareness/HR - Demonstrate an open mind (growth mindset) to understanding people regardless of their gender, age, race, national origin, religion, ethnicity, disability status or other characteristics; treat all people fairly and consistently; work with people from diverse backgrounds by treating them with dignity and respect.

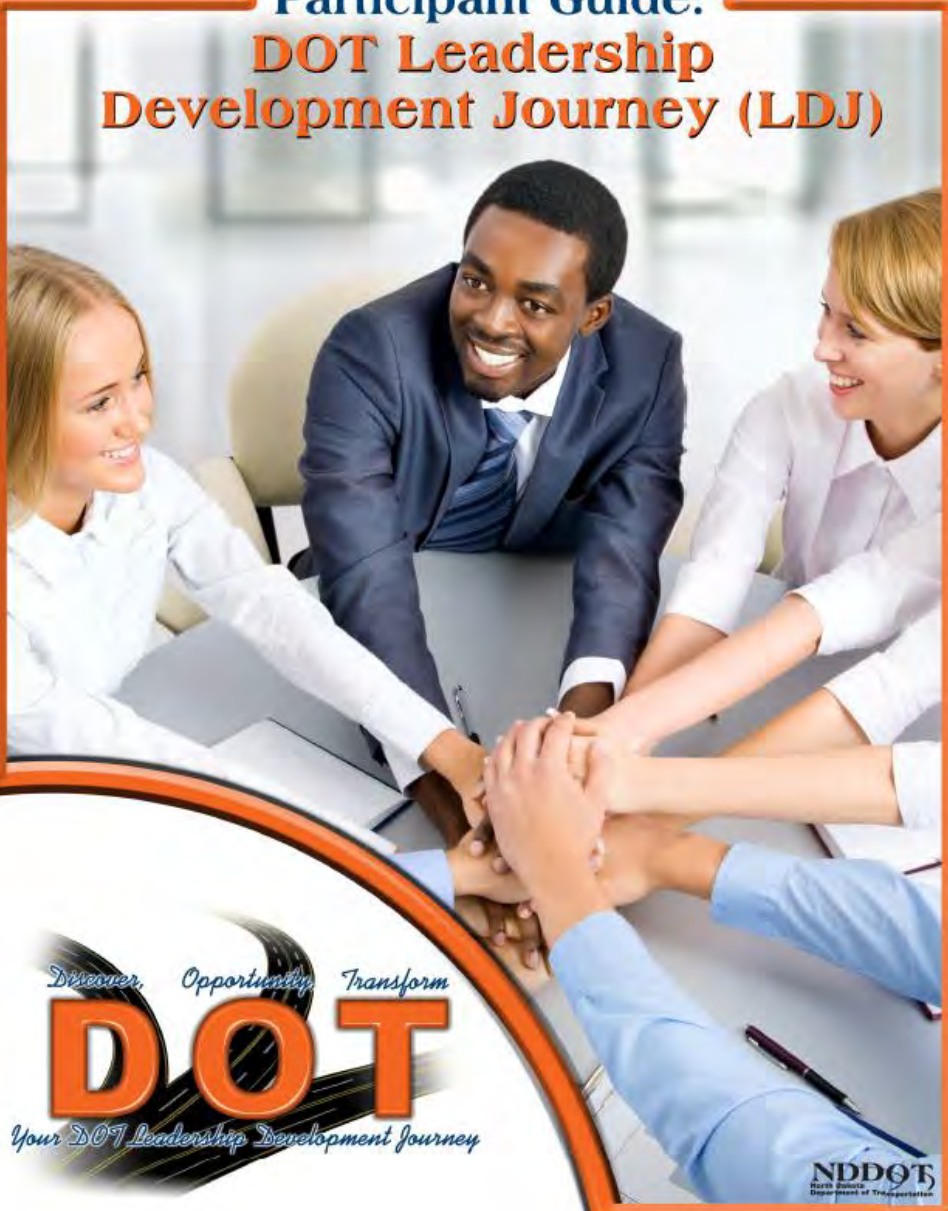
Teaching Others - Enhance the capabilities of the NDDOT by openly and effectively sharing subject matter expertise with others; support a continuous learning environment by preserving and compiling intellectual capital (knowledge management) which can be used by others to propel NDDOT as a transportation leader well into the future.

We also need to be mindful of additional growth opportunities within the State of ND and throughout the transportation industry on a national level. This may include but is not limited to Political Savvy, Situational Awareness, and Influence.



..... Guides

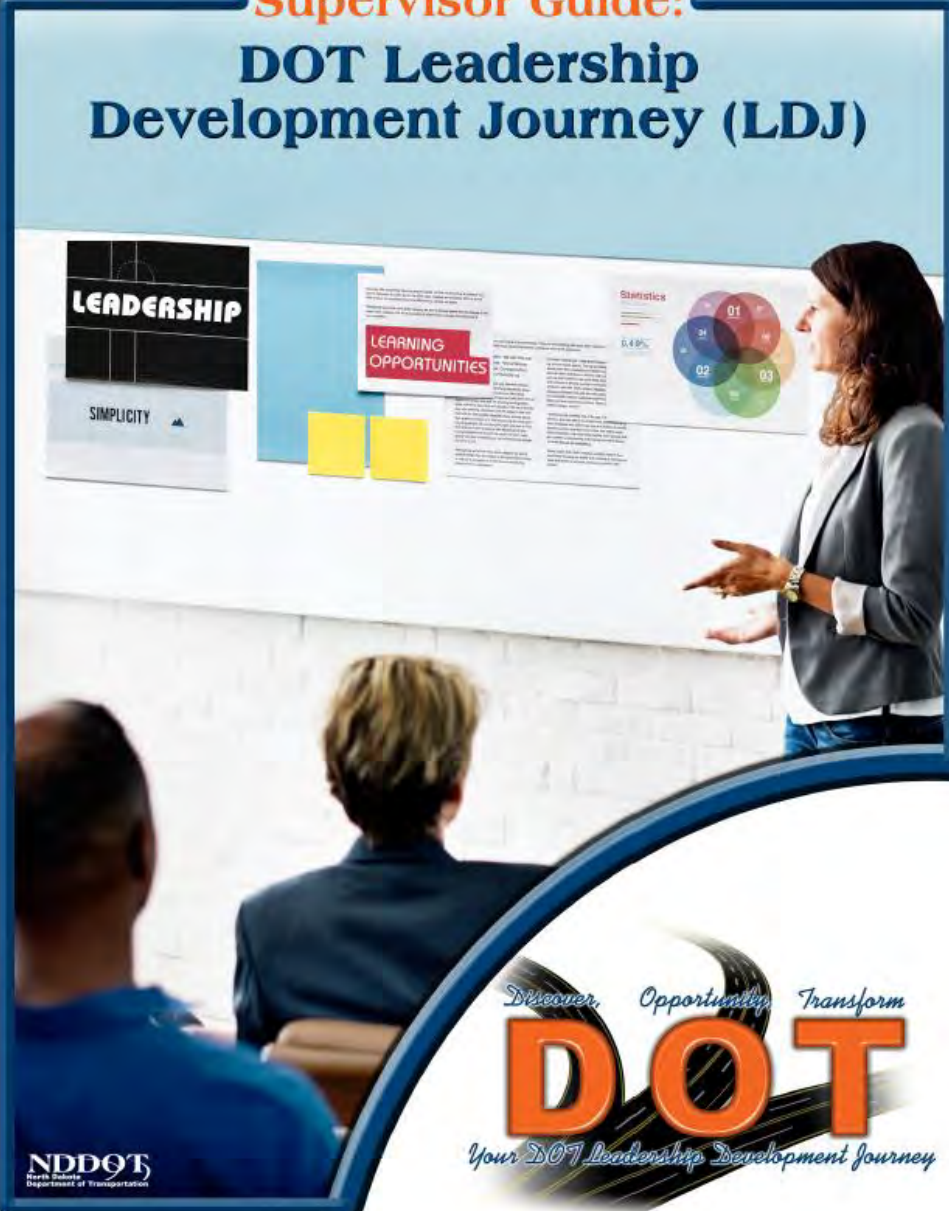
**Participant Guide:
DOT Leadership
Development Journey (LDJ)**



Discover. Opportunity. Transform
DOT
Your DOT Leadership Development Journey

NDDOT
North Dakota
Department of Transportation

**Supervisor Guide:
DOT Leadership
Development Journey (LDJ)**



LEADERSHIP

LEARNING OPPORTUNITIES

Statistics
6.48%

Discover. Opportunity. Transform
DOT
Your DOT Leadership Development Journey

NDDOT
North Dakota
Department of Transportation

Menu

For All Lanes and Levels of Learning

- NDDOT Lunch & Learn Program
- Division or District Highlights
- NDDOT Book Club
- Cross Training
- Informational Interviews
- Job Shadowing
- Visit NDDOT Worksites
- Take Part in Community NDDOT Sponsored Events
- After Action Reviews
- Briefing and Debriefing
- Collegial Coaching
- Communities of Practice (CoP)
- Good Practice
- Knowledge Networks
- Creatrix Workshops
- Professional Associations

Learning Opportunities Menu:
DOT Leadership Development Journey (LDJ)

INTEGRITY
judgment
COMPETENCE
VISION
PERSISTENCE
HUMILITY

Discover. Opportunity. Transform.
DOT
Your DOT Leadership Development Journey

NDDOT
North Dakota
Department of Transportation

Menu

Coming Soon! State of North Dakota “Building Leaders... Everywhere”

- Two formal curriculums/paths will be offered. Courses may be taken individually as well.
- Additional development opportunity as a Certified ND Gov Train-the-Trainer through the LEAD Program. You must be nominated by your agency.
 - Goals for LEAD are 1) to increase shared leadership development vocabulary and understanding for all ND Gov team members (and citizens longer term); 2) to create training leaders mindset; and 3) to share knowledge bidirectionally.
 - Participate in “training pods” facilitating a minimum of four times per year.
 - Monthly and other experiential learning will also be part of LEAD.

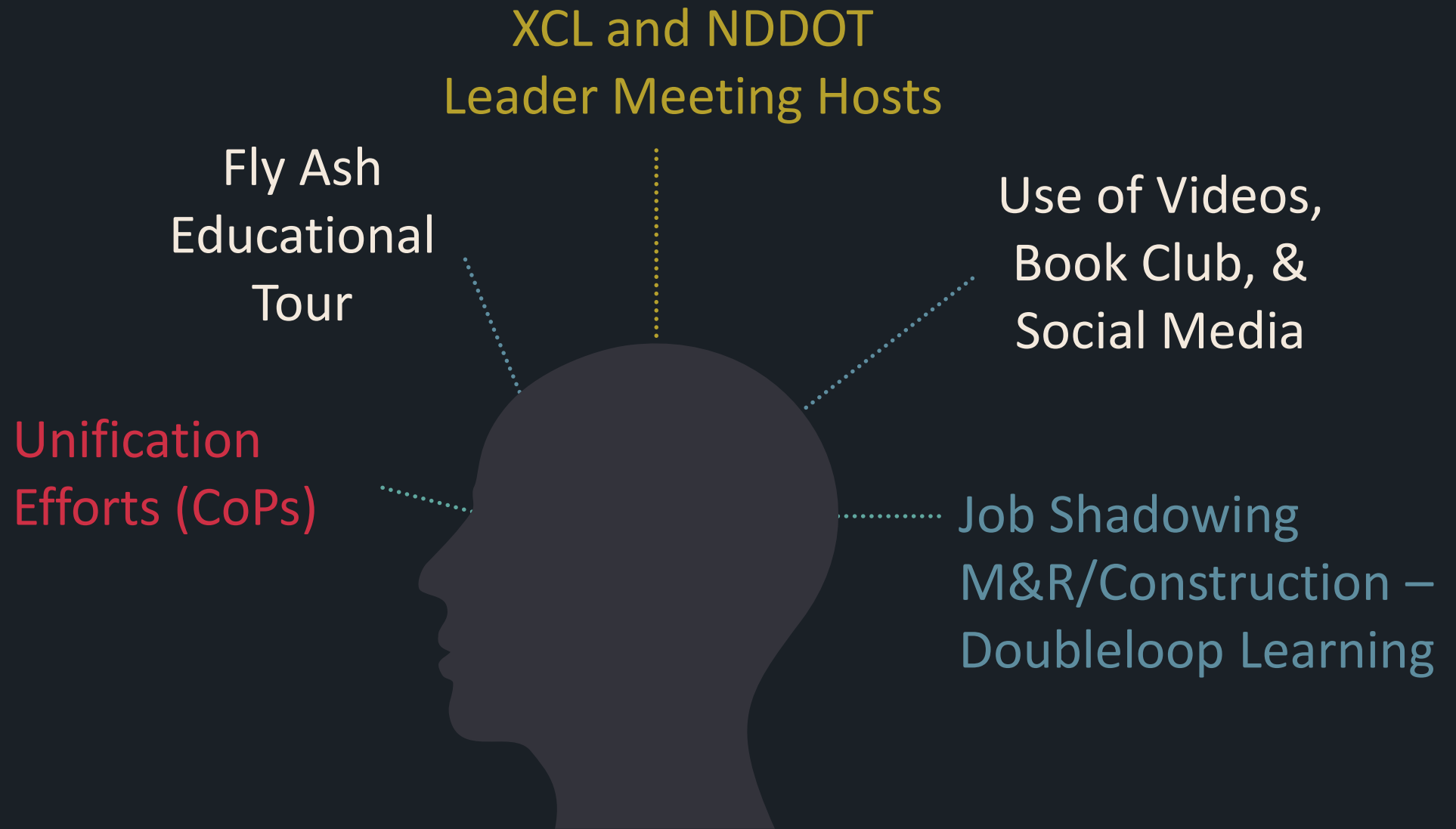
Learning Opportunities Menu:
DOT Leadership Development Journey (LDJ)

INTEGRITY
judgment
COMPETENCE
VISION
PERSISTENCE
HUMILITY

Discover. Opportunity. Transform.
DOT
Your DOT Leadership Development Journey

NDDOT
North Dakota
Department of Transportation

ND Knowledge Transfer Examples



▶..... Thank You!

Nikki Sackman
Human Resource Division Director

nsackman@nd.gov
701-328-4365



Nikki Sackman
Human Resource Director II at North Dakota Department of Transportation
1w

#leadershipdevelopment

Douglas Conant Following
Founder, ConantLeadership; Former CEO, Campbell Soup Company; Chairman, C.E.
1w

In my experience, if you give people the tools and energy to do their jobs with distinction, they will perform better and stick around longer. One powerful way to give people energy is by providing plentiful opportunities for them to learn and grow. Champion a learning culture. Let them take classes, go to conferences, pursue professional development. When you help people thrive, they get more engaged and stay excited about work. People don't want to remain stagnant; they want to embrace their full capability. Support their development and provide tangible opportunities for learning. It's a win-win for everyone.

2 Likes

ITD Supplemental Information

Program Delivery Survey Results 2020

Equipment Operator Training Program 2020 – Dump truck, snow plows, loaders, backhoe, mini excavator, motor grader

TTO Training Requirements 2020, Step 1

TOTL Training Requirements 2021, Steps 1, 2, and Continuing Education

TESL Training Plan 2021

Transportation Technician, Engineering (TTE) Training Plan 2021, Steps 1, 2, 3

PROGRAM DELIVERY CONFERENCE
POST WEBINAR SURVEY

TECHNICAL
PDC20
EXCELLENCE

JULY 16, 2020
CONTRACTING SERVICES SECTION

Email Invitation

HELLLO!!! On behalf of the Program Delivery Conference Committee, we would like to thank you for participating in this year's Virtual PDC20 Conference. We hope that you learned something new or were able to refresh your skills even in this new virtual meeting format!

Please take a moment to complete a very short 3-minute (10 easy questions) survey on the session you took on **June X, 2020** on **Title**. Please go to the survey at: [SurveyMonkey](#)

OK, now the bad news... if you took more than one PDC20 session, we are asking that you take a survey for each class. The information will help our speakers/trainers, the PDC Committee as well as Training and Development better serve you.

Don't forget that Training and Development is keeping track of your attendance and HCP credits should show up in your Learning Hub profile. If you have any questions, please email Amanda Regnier.

PDC20 Attendance

Individual attendance was tracked for each session and an attendee list was provided by Training and Development via Excel spreadsheet. SurveyMonkey was used as a survey platform in which 29 post-webinar surveys were conducted. This is a summary of all 29 surveys.

PDC20 Virtual Conference	2019 PDC Conference
There virtual conference was held between April 13 and June 17, 2020 during 19 days	The conference was held between April 15-18, 2019 for 2.5 days
Total of 309 people participated in virtual classes: <ul style="list-style-type: none"> o District 1: 38 (12%) o District 2: 26 (8%) o District 3: 66 (21%) o District 4: 31 (10%) o District 5: 35 (11%) o District 6: 25 (8%) o HQ: 88 (28%) 	Total of 292 people participated in the event: <ul style="list-style-type: none"> o District 1: 34 (12%) o District 2: 12 (4%) o District 3: 59 (20%) o District 4: 36 (12%) o District 5: 39 (13%) o District 6: 22 (8%) o HQ: 90 (31%)
Total of 1412 participants in all sessions	Total of 876 participants in all sessions
There were 29 different sessions offered with an average of 49 people per session	There were 27 different classes offered with an average of 32 people per class
Attendees could select any or all virtual sessions they wanted to attend <ul style="list-style-type: none"> o Individual appearance ranged from going to 1 class to 20 classes. o The average person attended 4.6 classes. 	Attendees were permitted to attend only six classes during the conference
Average length of sessions was 90-minutes	Average length of sessions was 90-minutes

PDC20 SESSIONS		
Date	Session	Attendees
4/13/2020	Pedestrian Safety and Accessibility in Work Zones #1	46
4/23/2020	Lifecycle of a Project Budget	34
4/30/2020	DBE Goal Setting and Compliance Administration	15
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30 Classes	Total Class Attendance	1412

Survey Summary

- There was a 20% response rate to the 29 surveys sent.
- More than 90% stated that the webinars were the right length and were presented at the right speed.
- Concerning the webinars specifically:
 - 89% stated that the webinar delivered was what promised in the class description.
 - 97% agreed that the presenters were considered Subject Matter Experts and that they were knowledgeable about their topics.
 - 94% said that the subject matter presented was effectively presented and was understandable.
 - 87% indicated that they gained new knowledge that was applicable to their work.
 - 90% said they would recommend various sessions to their coworkers.
 - 87% agreed that the virtual platforms used worked well.
- Concerning the webinar series in general:
 - 88% stated that in light of the pandemic, the PDC20 webinar series was a great alternative to the in-person annual conference.
 - Barring any future pandemic concerns, 75% said they would like to return to having in-person events.
- More than 80% said that they took the classes because they wanted to gain a new perspective, to learn something or refine skills - not because they needed to satisfy their credit requirements.
- A couple of people said that it would be great to have an in-person conference augmented by monthly webinar series.
- When asked about how they heard about the webinar series:
 - 31% said they saw it on the Talent ED/Learning Hub
 - 23% were automatically registered for the class by their Trainer
 - 19% indicated that their District Trainer informed them about classes
 - 10% said their manager recommended attending
 - 17% stated that a coworker told them, they saw it in the Transporter and/or they heard an announcement.
- Concerning webinars in general:
 - More than 75% said that they thought the best days to hold webinar training was on a Tuesday, Wednesday and/or Thursday.
 - 41% indicated that a reasonable length for a webinar was 1½ - 2 hours long and 39% said that 1 to 1 ½ hours was reasonable.

Survey Questions

There was a 20% survey response rate

Total of 1412 participants attended in 30 virtual sessions (1 session was a 2-part class)

Q1: Did you attend the PDC20 webinar series?

- 95% stated they attended the PDC20 conference

Q2: How was the length of this webinar?

- More than 90% stated that the webinars were the right length and were presented at the right speed.
 - Much too short – 1 (0%)
 - Too short – 10 (4%)
 - About the right length – 237 (90%)
 - Too long – 13 (5%)
 - Much too long – 1 (0%)

Q3: How was the pace of this webinar?

- More than 90% stated that the webinars were the right length and were presented at the right speed.
 - Much too fast – 0 (0%)
 - Too fast – 9 (3%)
 - About the right speed – 219 (92%)
 - Too slow – 9 (4%)
 - Much too slow – 1 (0%)

Q4: Thinking about the specific webinar, on a scale from 1 (disagree completely) to 5 (agree completely), please rate how relevant the following statements are:

- The webinar delivered the information that I expected based on the class description.
 - 89% stated that the webinar delivered was what promised in the class description.
- The presenters were knowledgeable about their subject matter.
 - 97% agreed that the presenters were considered Subject Matter Experts and that they were knowledgeable about their topics.
- The subject matter was presented effectively and was understandable.
 - 94% said that the subject matter presented was effectively presented and was understandable.
- I gained new knowledge applicable to my work.
 - 87% indicated that they gained new knowledge that was applicable to their work.
- I would recommend this webinar to a coworker.
 - 90% said they would recommend various sessions to their coworkers.
- The webinar platform (WebEX, Teams, Zoom, etc.) worked well for me.
 - 87% agreed that the virtual platforms used worked well.

- Any comments?
 - Internet speeds and connections vary for everyone and make for a somewhat disjointed experience.
 - I did not like the WebEx platform because it was chunky and hard for the presenters to use.
 - Overall the webinar was great. I liked that there was a variety of speakers which kept it interesting and flowing.
 - The webinar format was very effective.
 - One thing I like about having the conference at a location is that time is designated for classes. Trying to do classes remotely has been a challenge (although a good alternative with the circumstances) but you still have work emails coming in and people trying to call you so it's easy to get distracted while viewing virtually. There's nothing that compares to being there in person in my opinion.
 - The in-person PDC has a lot of value in meeting and talking to co-workers from other parts of the state. I would say these webinars are a great replacement for the technical content of the PDC, but can't replace the informal networking/socializing/team-building that happens during the breaks between technical sessions. I would certainly encourage ITD to continue using this method to deliver additional training opportunities, but not to replace the PDC.
 - It would be great to have ongoing webinars throughout the year as well as an annual conference. This would create an ongoing educational system.
 - They tried fitting too much into a small time frame and when they went over time I had to go because I had another meeting, meaning I missed a third of the webinar. :(
 - The audio on the videos did not come through on WebEx.
 - If the equipment was available and useable it would have been way good. The demonstration was well presented and well retained. Thank you.
 - These speakers are so knowledgeable and we interact with them while doing our job, yet the web format is difficult to know who is talking. This makes it hard to know who to ask what when you go back to do your job. Half of these types of presentations is being able to meet our counterparts at HQ and build that level of trust and familiarity between the districts.

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- Please review the specific session in the following pages for this answer.

Q6: Thinking about the webinar series in general, on a scale from 1 (disagree completely) to 5 (agree completely), please rate how relevant the following statements are:

- In light of the pandemic, the PDC20 webinar series has been a great alternative to the PDC Conference.
 - 88% stated that in light of the pandemic, the PDC20 webinar series was a great alternative to the in-person annual conference.
- Barring any future concerns, I would like to resume the in-person PDC21 Conference next year.
 - Barring any future pandemic concerns, 75% said they would like to return to having in-person events.

- I would like to continue with having a PDC webinar series instead of an in-person annual conference.
 - A couple of people said that it would be great to have an in-person conference augmented by monthly webinar series.
- I took this webinar only because I needed credit hours (HCP, PDH, etc.).
 - More than 80% said that they took the classes because they wanted to gain a new perspective, to learn something or refine skills - not because they needed to satisfy their credit requirements.
- What additional webinar topics would you like to have available?
 - Did a great job with various topics this year - maybe more on construction inspection and things to look for.
 - I would like an innovative contracting class
 - I would like a full environmental training with modules is absolutely necessary and way overdue.
 - Can we have more classes on environmental and how to fill out ITD test forms and what would be considered a testing violation?
 - I would like classes on guardrail, hydroblasting, bridge rail transitions, bridge deck grades (removal and new pours) best practices.
 - Oversight and responsibility to maintain temporary traffic control – ITD's responsibility to act.
 - Oversight and responsibility to remove illegal and undocumented objects within the right-of-way – i.e. illegal signing, undocumented City signing, spoils from ditch clearing, undocumented access.
 - It might be nice to learn the process that goes into an ITIP Update and what that means.
 - I would like someone to go through all of the useful tools in our intraweb and how that will help with design (PATs, Project Lookup, Online Manuals, new SharePoint, etc.
 - Drilled shaft/Driven Pile Design
 - Roadway Drainage Design
 - Traffic Count Data – how it is collected, how it is used.

Q7: How did you hear about this webinar?

- Talent ED/Learning Hub Search – 122 (31%)
- District/HQ Trainer informed me – 71 (18%)
- I was automatically registered and received an invite to attend – 95 (24%)
- My manager requested that I attend – 38 (10%)
- My coworker told me about it – 13 (3%)
- The webinar was mentioned in an email I received – 48 (12%)
- I saw it in the Transporter – 3 (1%)
- I saw or heard an announcement for the webinar – 8 (2%)

Q8: Thinking about future webinars, which day(s) of the week work best for you to take webinar training? Check all that apply.

- Monday – 135 (16%)
- Tuesday – 218 (25%)
- Wednesday – 240 (27%)
- Thursday – 211 (24%)
- Friday – 65 (7%)

Q9: Thinking about future webinars, what is a reasonable length of time for a webinar?

- 1 to 1.5 hours long – 167 (40%)
- 1.5 to 2 hours long – 170 (40%)
- 2 to 3 hours long – 60 (14%)
- 3 to 4 hours long – 9 (2%)
- 4 to 6 hours long – 7 (2%)
- All day – 7 (2%)

Q10: Please indicate your location/agency.

District 1:	36 (13%)
District 2:	11 (4%)
District 3:	33 (12%)
District 4:	33 (12%)
District 5:	48 (18%)
District 6:	24 (9%)
HQ:	83 (31%)

Individual Session Comments

4/13/20 PDC20 WEBINAR SERIES: "Pedestrian Safety and Accessibility in Work Zones"

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- Even though you are an Engineering genius, there are things to be learned from people who actually use the ramp.
- New and effective methods to protect pedestrians in work zones.
- I will be more considerate of pedestrian access in construction projects.

4/23/20 PDC20 WEBINAR SERIES: "Lifecycle of a Project Budget"

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- Adjust cost estimates as you go, and try and do them early and often.
- It gave me a perspective on where the budget numbers come from and how they can change.
- The timing for programmed funds is critical in stabilizing our program.
- Gained new info on how the process of budgeting within ITD works.

4/30/20 PDC20 WEBINAR SERIES: "DBE Goal Setting and Compliance Administration"

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- I really took this to learn more about DBE process, and contract administration.
- Learned new processes for the state's DBE requirements. Ester did a wonderful job, engaging participants in this webinar. She is very knowledgeable about DBE and very articulate in her teaching style.

5/11/20 PDC20 WEBINAR SERIES: "ITD's Environmental Process and How it Works for You"

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- Try to avoid addendums.
- The required supplemental information for the ITD 1500.
- Work early with ITD Environmental staff to ensure a smooth compliance process.
- How and ore mining structure can collapse but the entire site may still be considered historic.
- I'm filling out 1500s, and the webinar provided lots of detail about the importance of the 1500 and how to fill it out.
- Do the environmental assessment at the very beginning, will make it much easier as the project progresses.

5/13/20 PDC20 WEBINAR SERIES: "AASHTOWare" Construction, Mobile Inspector and Mastering the Change Order Process"

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- Navigating AASHTOWARE for efficiently.
- I used this training while doing my DWR in AASHTOWare last week.
- Better understanding of the programs application.
- It helped explain the change order process.
- The change order process has evolved since I was in the construction section.
- Have a better understanding for creating change orders in the program

5/14/20 PDC20 WEBINAR SERIES: "Flexible Construction Windows and PSS Construction Payouts"

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- It detailed what to look at when figuring out a Work Start window.
- The background information as to why spending the money in the correct timeframe helped me understand.
- I really learned lot for the presentation I didn't know and I would recommended this class to anyone.

5/18/20 PDC20 WEBINAR SERIES: "Reinforcing Temporary Traffic Controls"

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- This ended up being a refresher, need to be clearer in description of class.
- Always consider the MUTCD.
- The Additional Tools were interesting.
- Always consider the MUTCD.
- It detailed the different types of TTC that I could use out in the field.
- What I learned about pedestrian fence was used the next week on my project.
- The multiple types of guardrail. We don't use all of those types.

5/19/20 PDC20 WEBINAR SERIES: "Hydraulics and Stormwater Collection"

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- Need to be more clear on what is being discussed, its seemed like it was focused more towards design, and engineers, not really for maintenance.
- Learned some of the new tools that are available to us in Hydraulics.
- I learned the importance of collaborating with the contractor regarding the stormwater collection system that is being implemented on your project.
- I've been taking several hydraulics courses this year because I think it is interesting and I think it will be helpful to me in the future.
- Designing stormwater ponds.
- It's important to visit the site to look at the drainage because there can be things in the field that can change things considerably.
- Reminder to use RUSLE2 for BMP design, and the existence of HydroCAD (free version!).
- This was a good refresher on the methods we use to calculate runoff and gave a limited example of stormwater layout.

5/20/20 PDC20 WEBINAR SERIES: "Pedestrian Safety and Accessibility in Work Zones"

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- I will be using lessons learned from this example to apply to a project that I am working on currently.
- We regularly underestimate the care and time necessary to accommodate pedestrians through work zones.

5/20/20 PDC20 WEBINAR SERIES: "Standard Drawing Training and April 2020 Update"

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- I learned what Standard Drawings changed for 2020 and how I need to implement Standard Drawings on my projects.
- There is an archive of old standard drawings, just not all of it is on the web page.
- What the difference is between Standard Drawings and Standard Details - standard Details need an Engineers Stamp.
- I use the standard drawings on a daily basis so this is very applicable to what I do.

5/20/20 and 6/2/20 PDC20 WEBINAR SERIES: "GPS Field Technology: Digital Inspection a New Approach"

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- Great new tools.
- The GPS Technology might be useful in quantifying stockpiles in our ITD sources.
- Great details on the equipment and scanning in the field.

- When equipment becomes available I would love to use the unit to do Bridge surveys.
- How the equipment is used to correct the data and deliver it in a useable format.

5/27/20 PDC20 WEBINAR SERIES: "Cultural Resources Compliance for Transportation Projects"

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- Great presentation with helpful information.
- Lots of great history and pictures!
- I'll use this information in my TTO work plans in the future.
- This is specific to transportation funded projects, meaning only DOT's have to avoid or mitigate cultural resources.
- Cultural Compliance for Transportation Projects is very manageable if the contractor collaborates and communicates with ITD throughout the project.
- I learned what laws ITD needs to follow and how it affects the handling of historic properties if federal money, federal land, or a federal permit is used.
- Better understanding of the process.
- I believe this training would be very valuable to all ITD PMs, and will help them to scope and estimate preliminary design better.
- Learning history of the 1500 and the 5 "W's" of the Cultural Clearance really helped to follow the logic behind the methods.
- Use the 654 form.
- Understanding the process. Knowing that early coordination with Cultural Resources staff is helpful in getting projects completed.
- The importance of preserving Idaho's historical sites.

5/27/20 PDC20 WEBINAR SERIES: "Scoping, Evaluating and Negotiating"

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- The Scoping portion of this webinar was particularly helpful for me for future projects.
- Excellent examples and exercise on Negotiation.
- Learning how to negotiate a contract.
- When drafting a scope of work involve a SME that pertains to the work to be completed. Even if you have to reach out to another district.

5/28/20 PDC20 WEBINAR SERIES: "Are You Ready for Advertisement"

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- Bid date calculator shows how much time it takes to advertise.
- More to it than I thought.
- The overall process.
- I learned about Advertisement, how it interfaces with the rest of the schedule, and preparing for PS&E submittal.

- Doing it right the first place makes it less stressful and the advertisement process will be completed faster.
- Public outreach at local grocery stores or farmers markets can gain a larger audience than having a public meeting at ITD and go beyond the social media platforms and ITD websites.
- Gained some insight about why addenda during bidding are such a big deal. Helped me understand timeline requirements for advertising and bidding.

6/4/20 PDC20 WEBINAR SERIES: "Project Management at ITD"

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- It is important to prepared and maintain the Charter throughout the project to assure projects are delivered as intended and within budget. Also it is a central tool to document changes in scope and/or cost.
- Asset Management is very important to upholding our commitment to the taxpayers of Idaho of providing the best product for a reasonable amount of money. HQ PMO is always available and willing to help.
- This training allows me to better understand how to work with District project managers.
- The planning and scoping group initially fill out the charter which is continued by the project manager.
- The charter is a living document.
- Best practices.
- Clarification on how charters will implemented for future projects.
- I will use the information on a daily basis.

6/4/20 PDC20 WEBINAR SERIES: "Right-of-Way: Your Solution for Success"

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- Content presented was kind of us-and-them and not as much what we can do together to achieve ROW goals.
- Learned more about how the process works.
- I learned something about survey work that I did not know before.
- Early coordination on ROW component is key.
- Right-of-Way plans information that was very helpful.
- Contact right-of-way early in project development. Early coordination makes the ROW process easier to navigate.

6/4/20 PDC20 WEBINAR SERIES: "Basic Surveying"

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- This course has a very good information about the background of Basic of survey.
- It is very important to protect and retain survey markers, as these points become the starting point to describe property boundaries.
- Learning the history of the PLSS was awesome and helped with background understanding of today's PLSS.

- The importance of not moving survey markers, and the fact that most survey lines are also where streets run.
- Using the technology demonstrated during the training will it easier to survey material source stockpiles.
- It was nice to understand what goes into the surveying.
- I have a greater appreciation of effort surveyors put in to get the information I need to do my job.

6/4/20 PDC20 WEBINAR SERIES: "Beyond Negotiations – Steps to Developing an Agreement"

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- People are going to miss Holly when she retires.
- Learning about when best to use a fixed fee or a loaded rate agreement.
- The loaded rate is used for the duration of the agreement. The second phase is negotiated with new updated rates.

6/4/20 PDC20 WEBINAR SERIES: "Interchange Justification Requests and Interchange Modification Requests"

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- Interesting what it takes to justify an interchange.
- Something new that I learn is the IC justification has to support the location of the proposed IC and show that will not impede the operation of the freeway. Contradictory to the old rule of no loser that 2 miles apart.
- Provides a good overview of the IMR/IJR process.

6/9/20 PDC20 WEBINAR SERIES: "Public Involvement Today"

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- The need to communicate early, effectively and often.
- Early planning is key to success.
- Good job switching slides and presenters. I appreciate Bryant's perspective a lot.

6/9/20 PDC20 WEBINAR SERIES: "Bridge Preservation Treatments and Best Practices"

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- I would like to have more webinars like this.
- The presentation was excellent and in depth.
- I learned about the different types of preservation techniques.
- Good information for new hires and people that have not had a bridge repair project.

- It was interesting to learn the different types of treatment that can be applied for bridge rehabilitation, the effort needed, and the cost of each one.
- What to look for like excessive delamination during cleaning / blasting the bridge deck. Examples were great.
- This helped me to understand what goes into bridge deck repair and the scoping processes behind it.
- The information will help me in my understanding of bridge rehabs during my drawing phase and understanding of the process required.
- I gained insight as to why ITD prefers Hydroblasting for bridge deck removal.
- The percent of bridges in the state that are not done. Will help in the planning of new projects.
- I have a deeper knowledge of the processes involved.

6/10/20 PDC20 WEBINAR SERIES: "Mixed Design Submittal Reviews and Protocols"

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- The webinar was good for helping me understand what the HQ Lab folks do with a mix design, but what I was hoping to learn is what PMs and Materials.
- Engineers should look for in a mix design submittal before it even goes to the lab.
- Chad did a great job with the presentation. It would have been nice to meet/see Heather and Eric so people in the farther districts could put faces to names...but overall it was a really good presentation.
- This course helped prepare me for what's ahead and what is expected when testing concrete and plant mix.
- Trying to understand how we are going to test.
- I learned specific causes for design expiration and resubmission, and obtained detailed information on test ship acceptance.
- I learned more about what a sample size should look like when it is properly sampled and labeled (prior to going to HQ). I will watch for this submittal now.

6/10/20 PDC20 WEBINAR SERIES: "Communicating with the Media and Stakeholder Engagement"

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- Megan did such an EXCELLENT job teaching this content. I learned so helpful tips, in communicating with the media, preparing for an interview. Loved all of the content, her teaching style was great.
- It was based on what NOT to do instead of what to do. Very negative tone.
- Nothing is ever "off" the record. You can ask for the questions to prepare before the interview.
- nothing is "off the record"
- How to prep and prepare for a media interview.
- Always be positive when communicating with stakeholders.
- It was very negative, only what not to do.
- The idea of knowing what you want to say in advance and then sticking to the message you want to convey.

6/11/20 PDC20 WEBINAR SERIES: "MASH Guardrail Implementation and Design"

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- This was the best webinar (including in person class) I've ever attended. I thought the format and presentation was easy to follow and understand. The examples with video to show "don't do this/do this" was very helpful. Overall excellent presentation!
- Crash testing results of different types of guardrail.
- It was very beneficial to demonstrate the need to improved guardrail to the new MASH compliances. As well as how to better establish length of run.
- This was a review for me as I attended a two-day class last year. However I learned more about clear zones that I did before.
- Good information to bolster my current understanding of guard rail analysis.
- Deflection with cable guardrail and the location of guardrail in relation to swales.
- I learned details for determining which barrier to use.
- It will help me be a better inspector of projects that have new guardrail.
- Not to bury the guardrail terminal into the mountain side or allow a berm to be created.
- I will use the right rail for the right situation.
- Knowledge of the different types of guardrail ends.

6/11/20 PDC20 WEBINAR SERIES: "Right-of-Way: Your Solution for Success"

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- Content presented was kind of us-and-them and not as much what we can do together to achieve ROW goals.
- Learned more about how the process works.
- I learned something about survey work that I did not know before.
- Early coordination on ROW components is key.
- Contact Right-of-Way early in project development.
- Right-of-Way plans information that was very helpful.
- Early coordination makes the right of way process easier to navigate.

6/15/20 PDC20 WEBINAR SERIES: "Specification Writing"

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- This was one of the best courses I've taken at any of the PDCs!
- It is important to write specifications in plain English, be clear / specific and avoid general terms such as "includes, but not limited to". Avoid passive voice.
- Use of e.g and i.e.
- Words to avoid.
- I thought the changes to spec writing was really informative. Using will instead of shall, how to be specific in what we are writing, and cutting out some of the fluff.
- As I review overhead rates submitted to ITD, this was a chance to learn about the other steps in the process are effected by the overhead rates.

- I liked the most common misused words and mistakes made in specification presented at the end of the presentation.

6/16/20 PDC20 WEBINAR SERIES: "Local Plans in a Statewide Context"

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- No comments

6/16/20 PDC20 WEBINAR SERIES: "Asset Management"

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- Pointed me in the direction of Jim Poorbaugh as a potential candidate to use business objects for enterprising reporting needs.
- Jim Poorbaugh really knows his stuff. His presentation was excellent, informative and useful.
- Asset management is absolutely critical for the development of future projects.

6/17/20 PDC20 WEBINAR SERIES: "Pavement Design"

Q5: Please name one takeaway you learned during the webinar or give a description of how you might use the training information in your work.

- Software used.
- Considerations of the design.
- This training will help with the understanding of pavement design.

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EQUIPMENT OPERATOR TRAINING PROGRAM

Dump Trucks, Snow Plows, Loaders, Backhoe, Mini Excavator & Motor Grader

July 29, 2020

1. INTRODUCTION

The Idaho Transportation Department's (ITD's) Equipment Operator Training Program (EOTP) is intended to assure qualified personnel are operating equipment in a safe and efficient manner. To that end, the program provides our operators with an ITD-standard initial training and certification on safe operation, basic user maintenance, and entry-level technical quality.

The dump trucks, snowplows, and bucket loaders program comprised of a two-week training course, pre-course on-the-job training, written exam, practical exam, classroom curriculum, post- course on-the-job-training, and certification. Under this initial program rollout, relevant individuals are required to obtain certification for dump trucks, snowplows, and bucket loaders prior to operating the equipment independently. These equipment certifications are a condition of achieving Transportation Technician Operation Program (TTO) Step 1.

The backhoe, mini excavator and trench safety program involves a forty-hour training course, pre-course on-the-job training, written exam, practical exam, classroom curriculum, post- course on-the-job-training, and certification.

As with all equipment, all individuals are required to obtain certification prior to operating the equipment independently. These equipment certifications are a condition of achieving Transportation Technician Operation Program (TTO) Step 2.

The road grader involves forty hour training course, pre-course on-the-job training, written exam, practical exam, classroom curriculum, post- course on-the-job-training, and certification.

As of July 1, 2020 all individuals are required to obtain certification in Road Grader, prior to independent operation. This equipment certification is an option of achieving Transportation Technician Operation Program (TTO) Step 3.

ITD's agreement with the Kootenai Technical Education Campus (KTEC) allows equipment operator training and examination sessions to be administered to ITD employees. ITD sponsors both the training and the associated examination sessions.

2. APPLICABILITY

Equipment training and certification applies to TTAs, TTOs, TOTLs, Mechanics, Hourlies, Relief Drivers and anyone else who operates covered equipment (currently dump trucks, snowplows, loaders, backhoe, mini excavators, and motor grader. All personnel who operate covered equipment are included because the program was

developed to ensure that all employees receive the same baseline training pertaining to safety, operations, and preventive maintenance of equipment.

➤ **DUMP TRUCK, SNOWPLOWS AND LOADERS**

- A. All employees in TTA are required to complete the entire two-week training course for dump truck, snowplow and loader.
- B. All other employees who operate covered equipment and whose certifications were not current by January 1, 2020 must complete the two-week training course.
- C. Employees who were certified on covered equipment before January 1, 2020 do not have to take the course but must re-certify every five years. Thereafter, employees who are certified on covered equipment will be required to participate in an one-day recertification every five years.
 - a. Note that the certification process prior to implementation of the EOTP (i.e., the current process before March 1, 2019) is defined as follows: prior to independent operation, an employee is tested in pre-trip, operation, and shutdown procedures by a designated individual appointed by the District Operations Engineer/DE and overseen by the District Trainer.
 - b. This information is then recorded on documents approved by Horizontal Career Path Committee then reported in TalentED.
- D. Experienced (prior) hourly and relief snowplow drivers will need to be certified before January 1, 2021.
 - a. Employees still need to be certified before operating independently.
- E. New hourly and or relief snowplow drivers will need to attend the full course prior to independent operation.
- F. Employees are required to hold a CDL Class A and/or permit prior to attending the two-week course.
- G. Each relevant employee (see above) will be required to complete the two-week course, including passing both written and practical exams.
- H. Each employee is required to sign an Equipment Operator Responsibilities Agreement, [ITD Form 0324 \(Appendix D\)](#).

➤ **BACKHOE, MINI-EXCAVATOR AND TRENCH SAFETY**

- A. All employees in TTO Step 2 are required to complete the entire forty hour training course for backhoe, mini excavator and trench safety.
- B. All other employees who operate backhoe, mini excavator equipment and whose certifications were not current by May 1, 2020 must complete the forty-hour training course for backhoe, mini excavator and trench safety.
 - a. Note that the certification process prior to implementation of the EOTP (i.e., the current process before May 1, 2020) is defined as follows: prior to independent operation, an employee is tested in pre-trip, operation, and shutdown procedures by a designated individual appointed by the District Operations Engineer/DE and overseen by the District Trainer.

- C. Employees certified on backhoe and mini excavator equipment before May 1, 2020 do not have to take the course but must re-certify every five years. Thereafter, employees who are certified on backhoe and mini excavator equipment will be required to participate in an one-day recertification every five years.
- D. Each relevant employee (see above) will be required to complete the forty-hour course, including passing both written and practical exams.

➤ **MOTOR GRADER**

- A. All employees who are currently working towards TTO Step 3 have the option to complete the entire forty hour training course for basic motor grader operations. All TTO Step 3 equipment options are at the discretion of District Management to meet the business needs.
- B. All other employees who operate a motor grader and whose certifications are not current by July 1, 2021 must complete forty-hour training course for motor grader.
 - a. Note that the certification process prior to implementation of the EOTP (i.e., the current process before July 1, 2021) is defined as follows: prior to independent operation, an employee is tested in pre-trip, operation, and shutdown procedures by a designated individual appointed by the District Operations Engineer/DE and overseen by the District Trainer.
- C. Employees certified on motor grader before July 1, 2021 do not have to take the course but must re-certify every five years. Thereafter, employees who are certified on motor grader will be required to participate in an one-day recertification every five years.
- D. Each relevant employee (see above) will be required to complete the forty-hour course, including passing both written and practical exams.

➤ **Rotary Snowplow, Striping Truck, and Vegetation Spray Truck**

- a. As an option to meet TTO Step 3 requirement and business need per the direction of District Management, TTO Step 2 working towards TTO Step 3 can obtain certification on the above mentioned equipment by a designated individual appointed by District Operations Engineer/DE and overseen by the District Trainer. Prior to independent operations employees will be tested in pre-trip, operation, and shutdown procedures. These pieces of equipment do not currently require classroom curriculum.

3. **ROLES AND RESPONSIBILITIES**

- B. Training and Development – Provide program support and provide Learning Management System to track and report EOTP sessions. Equipment Trainers will conduct classroom and performance training and provide written and performance examinations supplied by KTEC.

C. District Operations –

- a. Operations Engineers (OEs) - provide program oversight and accountability for consistent training to all employees. Ensures corrective action is taken after reported as needed.
- b. Transportation Operation Team Leads (TOTLs) – Attend training provided by ITD accredited through KTEC or 5-year renewal as applicable, provide training to others as needed, ensure local OJT Trainer is providing adequate guidance to new hires, and document OJT. Report employee incidents if/as they occur.
- c. Transportation Technician Operations (TTOs) having completed required Equipment Certifications and selected by district staff can conduct – OJT training; attend training provided by ITD accredited through KTEC or 5-year renewal as applicable and follow appropriate training guidelines for consistent training as they work with all employees.

4. ITD CANCELLATION POLICY

The targeted minimum size for an initial and recertification course session and qualification should be five students. If the minimum size is not reached, the course session may be canceled. Sessions may be canceled for other reasons not specifically stated herein.

Every effort will be made to notify the applicants well in advance if a cancellation is necessary. If a session is cancelled, the applicant may request that he/she be enrolled in the next available session.

5. ON THE JOB TRAINING (OJT)

➤ **DUMP TRUCK, SNOWPLOW AND LOADER**

- A. Pre-OJT – each employee shall complete 10 hours of documented On-the-Job- Training (OJT) for dump truck, snowplow and loader prior to start of the two-week course. ([See Appendix B, ITD Form 0322](#))
- B. Post-OJT – each employee shall complete 30 hours of documented OJT for dump truck, snowplow and loader after course completion. ([See Appendix C, ITD Form 0323](#))
- C. The OJT shall be documented and signed off by Direct Supervisor and Employee. (See Appendices B, C)
- D. The OJT shall be provided by either 1) a TTO who holds a current certification and appointed by the TOTL, or 2) the TOTL.
- E. *Participants will not receive certifications until OJT has been completed.*

➤ **BACKHOE, MINI-EXCAVATOR AND TRENCH SAFETY**

- A. Pre-OJT – each employee shall complete 5 hours of documented On-the-Job-Training (OJT) for backhoe and mini excavator prior to start of the forty-hour course. ([See Appendix E, ITD Form 0325](#))
- B. Post-OJT – each employee shall complete 15 hours of documented OJT for backhoe and mini excavator after course completion. ([See Appendix F, ITD Form 0326](#))
- C. The OJT shall be documented and signed off by Direct Supervisor and Employee. (See Appendices E & F)
- D. The OJT shall be provided by either 1) a TTO who holds a current certification and appointed by the TOTL, or 2) the TOTL.
- E. *Participants will not receive certifications until OJT has been completed.*

➤ **MOTOR GRADER**

- A. Pre-OJT – each employee shall complete 10 hours of documented On-the-Job- Training (OJT) for Motor Grader prior to start of the forty-hour course. ([See Appendix G, ITD Form 0327](#))
- B. Post-OJT – each employee shall complete 30 hours of documented OJT for Motor Grader after course completion. ([See Appendix H, ITD Form 0328](#))
- C. The OJT shall be documented and signed off by Direct Supervisor and Employee. (See Appendices G & H)
- D. The OJT shall be provided by either 1) a TTO who holds a current certification and appointed by the TOTL, or 2) the TOTL.
- E. *Participants will not receive certifications until OJT has been completed.*

6. **EXAMINATION PROCESS**

Certification requires each Equipment Operator to pass both written and performance examinations which are designed to demonstrate both a knowledge and understanding of the equipment operation.

Examinees failing the first written will be given review time and will be able to retake the exam during the training week. Employees who fail the performance examination will be required to return to their designated work location to complete an additional documented 40 hours of OJT prior to re-testing.

A. **Written Examination**

The written examination is comprised of questions from course materials. The examinee must score a 70% or above to pass exam. Participants are required to pass written exam prior to attempting performance examination.

B. Performance Examination

The performance examination is comprised of skills tests on each piece of covered equipment where participants must demonstrate knowledge of preventative maintenance, pre-trip, start-up, safe operations and shut-down procedures. Participants must achieve a 100% to pass.

C. Examinations (Second Attempt)

Examination second attempts for both the written and performance exams will be conducted according to the same criteria as the original examinations.

D. Examinations (Third Attempt)

Employee should reach out to Operations Engineer (OE) to discuss options.

7. PARTICIPANT CERTIFICATION PROCESS (When do I become certified?)

Confirmation of the certification/re-certification should be posted on the Learning Hub approximately two weeks after successful completion of the certification exam process including completion of Pre/Post OJT.

To confirm a certification, it will appear on employee's completed transcript through TalentED. If the certification is not listed on the web page, the individual should contact Training and Development.

8. LENGTH OF CERTIFICATION

The time period shall be a five--year re-certification cycle calculated from the date of the passing exam. Certification(s) will expire on the last day of the month in which the initial exam portion was successfully completed.

9. CERTIFICATION RENEWAL

Certification renewal is required to be completed by the last day of the month in which the initial exam portion of the Certification was successfully completed in the fifth year after the initial exam.

The equipment operator is responsible for making arrangements for obtaining his/her applicable Certification renewal and must do so before the expiration date of the Certification. Renewal is the responsibility of the equipment operator.

10. UPDATES TO THE REGISTRATION, POLICIES, AND PROCEDURES

As changes to the program occur or other EOT program updates are required, the new information will be posted on the [ITD's Training & Development SharePoint site](#). Training and Development is responsible to update KTEC with any equipment changes.

11. PROGRAM REVISIONS / UPDATES

Revisions and updates to the Equipment Operator Training Program will be completed annually. The current version of the program can be found [here](#).

12. REVOCATION, SUSPENSION, OR DENIAL OF CERTIFICATION

- A. Revocation or suspension in one Certification will only be applicable to the equipment in question.

1. ON-THE-JOB-TRAINING GUIDELINES FOR EQUIPMENT

A. Determine a safe location to perform the skills training.

Note: A location with no audience is preferred.

B. After determining a safe location, prepare the area for the skills training by having the equipment and material available to complete required tasks.

C. Review the initial conditions for the skills training evaluation (from KTEC) with the employee. The trainer and the employee must clearly understand what is expected. The trainer should have a blank skills training evaluation form with the employee name and current dates.

a. Before allowing the employee to begin the skills training evaluation make sure the examinee is familiar with the brand of equipment that is being used.

Note: If the employee is not familiar with the brand of equipment stop the training and review operators manual with them.

b. Walk the employee through the course/location and skills that they will be asked to perform.

Note: Use the skills evaluation for the walk through.

c. Have the employee tell you what the expectations of the skills evaluation are.

d. When the employee is ready to begin the skills evaluation move to a safe location that you can observe them performing the required skills.

Note: As the trainer, feedback is important

D. Pre-Trip inspections shall be performed prior to operation of any equipment.

E. The employee is expected to perform the steps of the task in sequence unless the skills evaluation indicates differently. The trainer will document additional feedback.

F. If a knowledge question is linked directly to a procedural step, ask the question before moving on to the next step.

G. At any time the examinees actions may result in danger to the employee or damage to equipment or the environment STOP! Do not allow the employee to commit an unsafe act. Intervene immediately to prevent or stop unsafe performances. The trainer is fully responsible for the employee and is required to take control of systems/equipment during an emergency.

H. Coach only one employee at a time while conducting OJT. *Coaching is providing help, prompts, or suggestions that would not be available during normal task performance.* The employee shall perform OJT in the trainer's presence for the duration of the required OJT hours.

I. Provide feedback on OJT (covering strengths and weaknesses) with the employee.

J. Document and report results.

2. THE OJT TRAINER MUST BE ABLE TO:

- a) Demonstrate an understanding of the competency based approach to equipment training.
- b) Create a positive OJT training climate
- c) Use interactive OJT training (coaching) techniques
- d) Utilize competency based learning guides and checklists
- e) Demonstrate equipment operation skills during skill demonstration
- f) Coach when trainee needs assistance
- g) Assess skills and determine if a trainee is prepared to certify

APPENDIX B



**Your Safety • Your Mobility
Your Economic Opportunity**

Pre-Class OJT

ITD 0322 (Rev. 02-19) itd.idaho.gov

Name: _____

EMP#: _____

Equipment Training

Loader, Dump Truck, Snow Plow

Before Trainees take the Equipment training course they need to complete the following OJT (on the job training). This training should take place under the supervision of the Forman or an appointed mentor by supervisor. Mentor must have current certification in the equipment specified. The reason for this requirement it so everyone in class comes with the basic knowledge of the equipment. Please complete the following tasks:

Loader 10 hrs. Of OJT

Tasks	Hrs.	Verified by	Trainee Verified
Loader Pre-trip walk around			
Controls Operation (Lights, buttons, joystick)			
Safe operation of machine			
Basic Bucket control (stockpiling, Not digging)			
Loading a Dump truck			

Dump Truck 10 hrs. Of OJT

Tasks	Hrs.	Verified by	Trainee Verified
Dump Truck Pre-trip walk around			
Controls Operation (Lights, buttons, joystick)			
Safe operation of machine			
Dumping a loaded bed (pile, spreading)			
Connecting a trailer			

Snowplow 10 hrs. OF OJT

Tasks	Hrs.	Verified by	Trainee Verified
Snowplow Pre-trip walk around			
Controls Operation (Lights, Cirus, joystick)			
Safe operation of machine			
How to convert from dump truck to plow			
Operation of plow			
Operation of spreader			

Bring this form to class completed and signed by you and your supervisor.

Signature: _____ (Supervisor)

Signature: _____ (Trainee)

Date: _____



Your Safety • Your Mobility
Your Economic Opportunity

APPENDIX C

Post-Class OJT

ITD 0323 (Rev. 02-19) itd.idaho.gov

Name: _____

EMP#: _____

Equipment Training

Loader, Dump Truck, Snow Plow

After Attending the Equipment training course individuals need to complete the following OJT (on the job training). This training should take place under the supervision of the Forman or mentor appointed by the supervisor. Mentor must have current certification in the equipment specified. Snow plow OJT must be accomplished during winter storm/pre-treat conditions.

Loader 30 hrs. of OJT

Tasks	Hrs.	Verified by	Trainee Verified
Loader Pre-trip walk around			
Controls Operation (lights, buttons, joystick)			
Safe operation of machine			
Basic Bucket control (stockpiling, not digging)			
Loading a Dump truck			

Dump Truck 30 hrs. of OJT

Tasks	Hrs.	Verified by	Trainee Verified
Dump truck Pre-trip walk around			
Controls Operation (lights, buttons, joystick)			
Safe operation of machine			
Dumping a loaded bed (pile, spreading)			
Connecting a trailer			

Snowplow 30 hrs. of OJT

Tasks	Hrs.	Verified by	Trainee Verified
Snowplow pre-trip walk around			
Controls operation (lights, cirus, joystick)			
Safe operation of machine			
How to convert from dump truck to plow			
Operation of plow			
Operation of spreader			

Form should be completed and signed and sent to instructor to receive credit for class.

Signature: _____ (Supervisor)

Signature: _____ (Trainee)

Date: _____

APPENDIX D



Your Safety • Your Mobility
Your Economic Opportunity

Equipment Operator

ITD 0324 (Rev. 02-19)

itd.idaho.gov

Responsibilities Agreement

The following are guidelines that equipment operators will adhere to while operating ITD equipment. These guidelines are for your safety and the longevity of ITD equipment. Failure to follow these guidelines will result in review from District management.

*Please initial beside each statement to confirm that you have read
and agree to adhere to each:*

_____ I will operate the equipment in a safe manner at all times.

_____ I will wear my seatbelt at all times while operating equipment.

_____ I will not use my cell phone while equipment is in operation.

_____ I will only complete tasks that I feel I am competent and safe at completing.

_____ I will always complete a pre-operation inspection prior to using any piece of equipment.

_____ I will properly ascend and descend with three points of contact.

_____ I understand I have the right to stop work, if the conditions become unsafe for me or my co-workers.

_____ I will only operate equipment that I am ITD certified to operate.

_____ I understand that I am responsible for the preventative maintenance and care of the equipment in which I operate.

_____ Name (First, Middle Initial, Last)

_____ Employee #

_____ Signature

_____ Date

APPENDIX E



Your Safety • Your Mobility
Your Economic Opportunity

ITD 0325 (Rev. 1 Aug 2019) itd.idaho.gov

Pre-Class OJT

Name: _____

EMP#: _____

Equipment Training

Backhoe, Mini –EX,

Before Trainees take the Equipment training course they need to complete the following OJT (On the Job Training). This training should take place under the supervision of the Foreman or an appointed mentor by supervisor. Mentor must have current certification in the equipment specified. The reason for this requirement is so everyone in class comes with the basic knowledge of the equipment. OJT may be completed on either mini-ex or backhoe or a combination of both. Please complete the following tasks with the total adding up to a minimum of 5 hours:

Backhoe / Mini – EX / Excavator 5 hrs. Of OJT

Tasks	Hrs.	Trainer initials	Trainee initials
Pre/post-trip walk around			
Controls Operation (lights, buttons ,joystick)			
lubrication			
Maintenance items			
Basic operational movements (boom,arm,tracks)			

Bring this form to class completed and signed by you and your supervisor.

Signature: _____ (Supervisor)

Signature: _____ (Trainee)

Date: _____

APPENDIX F



**Your Safety • Your Mobility
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ITD 0326 (Rev.1 Aug 2019) itd.idaho.gov

Post-Class OJT

Name: _____

EMP#: _____

Equipment Training

Backhoe, Mini – EX

After Attending the Equipment training course individuals need to complete the following OJT (on the job training). This training should take place under the supervision of the Forman or mentor appointed by the supervisor. Mentor must have current certification in the equipment specified. OJT may be conducted on a backhoe, mini ex or a combination of both and should total a minimum of 15 hours.

Backhoe / Mini – EX / Excavator 15 hrs. Of OJT

Tasks	Hrs.	Trainer initials	Trainee initials
Pre-trip/post-trip walk around			
Controls Operation (lights, buttons ,joystick)			
Safe operation of machine			
Loading a Dump truck			
Maintenance			
Lubrication			

Form should be completed and signed and sent to instructor to receive credit for class.

Signature: _____ (Supervisor)

Signature: _____ (Trainee)

Date: _____

APPENDIX G



**Your Safety • Your Mobility
Your Economic Opportunity**

ITD 0327 (Rev. 14 July 2020) itd.idaho.gov

Pre-Class OJT

Name: _____

EMP#: _____

Equipment Training

Road Motor Grader

Before Trainees take the Equipment training course they need to complete the following OJT (On the Job Training). This training should take place under the supervision of the Foreman or an appointed mentor by supervisor. Mentor must have current certification in the equipment specified. The reason for this requirement is so everyone in class comes with the basic knowledge of the equipment. Please complete the following tasks with the total adding up to a minimum of 10 hours:

Road Motor Grader 10 hrs. Of OJT

Tasks	Hrs.	Trainer initials	Trainee initials
Pre/post-trip walk around			
Controls Operation (lights, buttons ,joystick ,sticks)			
Proper operation of winter accessories (Wing, V-plow)			
lubrication			
Maintenance items			
Basic operational movements (articulation, counter steer, Blade operations)			

Bring this form to class completed and signed by you and your supervisor.

Signature: _____

Signature: _____

Date: _____

APPENDIX H



Your Safety • Your Mobility
Your Economic Opportunity

ITD 0328 (Rev. 14 July 2020) itd.idaho.gov

Post -Class OJT

Name: _____

EMP#: _____

Equipment Training

Road Motor Grader

Tasks	Hrs.	Trainer initials	Trainee initials
Pre-trip/post-trip walk around			
Controls Operation (lights, buttons ,joystick ,sticks)			
Proper operation of winter accessories (Wing, V-plow)			
Safe operation of machine			
Proper usage of grader blade			
Maintenance			
Lubrication			

Form should be completed and signed and sent to instructor to receive credit for class.

Signature: _____ (Supervisor)

Signature: _____ (Trainee)

Date: _____



TTO Training Requirements, Step 1

Checklist of items to be completed by June 15

REQUIREMENTS			DATE
TRAINING	TYPE	HOURS	
<i>Workplace Training</i>			
Behavioral Styles in the Workplace	Instructor-led	4	
Constructive Culture	Instructor-led	4	
Respectful Workplace	Online	0.5	
<i>Software Systems</i>			HOURS
Technology Boot Camp	Instructor-led	16	
Visalia PowerPoint Presentation	Online	0.5	
<i>Operator Training</i>			HOURS
9.02 Defensive Driving	Instructor-led	3.5	
5.86 Proper Plowing Techniques	Online	1.5	
10.28 General Flagger Training	Instructor-led	3.5	
10.07 Basic Traffic Control	Instructor-led	4	
5.51 Storm 101	Instructor-led	6	
<i>Industrial Safety</i>			HOURS
9.11 First Aid/CPR/AED 2-Year	Instructor-led	4	
5.25 Hazardous Materials Module 1 'Employee Awareness'	Instructor-led	4	
Fall Factors	Online	0.5	
Ladder Safety	Online	0.5	
PPE: Your Last Layer of Protection	Online	0.5	
Powerlift	Online	0.5	
<i>SKILLS TESTING</i>			HOURS
12.01 Loader Certification		20	
12.02 Dump Truck Certification		20	
12.03 Snowplow Certification		40	

LAST REVISION DATE: 6/18/2020. These requirements may be subject to change.



TOTL Requirements, Step 1

Training Requirements to be completed within first year of Step 1 by June 15

REQUIRED COURSES				DATE
<i>TRAINING – Hours Required</i>	<i>TYPE</i>	<i>Hours</i>		
Workplace Training				
Behavioral Styles in the Workplace Course	Instructor	4		
Constructive Culture	Instructor	4		
Constructive Communication	Instructor	8		
Customer Service	Instructor	4		
Leadership Training			Hours	
Leadership 101 (Formerly Tier 1 Training)	Instructor	25		
Leadership 102 (Formerly Tier 1 Training)	Instructor	21		
Safety Training			Hours	
Safety Train Supervisor (STS)	Instructor	16		
Technical Training				
5.51 Storm 101	Instructor	6		
5.52 Storm 102	Instructor	4		

LAST REVISION DATE: 6/5/2019. These requirements may be subject to change.



TOTL Requirements Step 2 & Continuing Education

Minimum of 40 hours of training to be completed per step by June 15

REQUIRED COURSES			DATE
TRAINING – Hours Required	TYPE	Hours	
Technical Training			
5.53 Storm 103	Instructor	8	
ELECTIVES			DATE
TRAINING ELECTIVES	TYPE	Hours	
Technical Training			
4.12 On the Job Training (OJT) Model for Subject Matter	Instructor	24	
Trenching & Excavation Safety	Online	1	
10.76 Worksite Traffic Control Supervisor Certification (or	Instructor	8 (or 16)	
Effective Business Writing Workshop	Instructor	16	
Software Training			
Outlook: Core Class	Instructor	4	
Data Analysis with Microsoft Excel	Instructor	4	
Word: Overcoming Things that Drive You Crazy	Instructor	4	
RECERTIFICATIONS			DATE
Technical Training		Hours	
5.25 Hazardous Materials	Instructor	4	
9.02 Defensive Driving	Instructor	3.5	
9.11 First Aid/CPR/AED 2-Year	Instructor	4	
10.07 Basic Traffic Control	Instructor	4	
10.28 General Flagger Training	Instructor	3.5	
ONLINE TRAINING (TC3)			DATE
Earthwork Series: Earth Materials and Engineering Materials	Online	1.5	
Earthwork Series: Excavation	Online	3	
Earthwork Series: Fill Placement	Online	4	
Earthwork Series: Grades and Grading	Online	3	
Earthwork Series: Site Preparation	Online	1.5	
Erosion and Sediment Control	Online	3.5	
Guardrail series: Guardrail Basics	Online	2	
Guardrail series: Installation and Inspection of new guardrails	Online	2.5	
Guardrail series: Maintenance and Repair	Online	1.5	
Improving the Daily Diary	Online	1.0	
Plan reading: Bridge plans	Online	1.5	
Plan reading: County Plans	Online	1	
Plan reading: Culvert Plans	Online	1.5	



Plan reading: Erosion & Sediment control plans	Online	.5	
Plan reading: Grading plans	Online	1.5	
Plan reading: Highway Plan reading basics	Online	1	
Plan reading: Right of way plans	Online	1	
Plan reading: Traffic Control plans	Online	.5	
Basic Materials for Highway and Structure Construction	Online	3	
Fundamentals of Geosynthetic Materials	Online	4	
Flexible Pavement Preservation Series: Chip Seals	Online	1.5	
Flexible Pavement Preservation Series: Crack Sealing/Filling	Online	1.25	
Flexible Pavement Preservation Series: Fog Seals	Online	1	
Flexible Pavement Preservation Series: Intro to Pavement	Online	1	
Flexible Pavement Preservation Series: Localized Pavement	Online	1.25	
Flexible Pavement Preservation Series: Materials	Online	2	
Flexible Pavement Preservation Series: Micro surfacing	Online	1	
Flexible Pavement Preservation Series: Selecting the right	Online	.5	
Flexible Pavement Preservation Series: Slurry seals	Online	1.25	
Flexible Pavement Preservation Series: Thin functional HMA	Online	2	
Flexible Pavement Preservation Series: Ultra-thin HMA	Online	1	
Full Depth Reclamation	Online	4.5	
Job Hazard Analysis	Online	2	
Maintenance of Traffic for Supervisors	Online	5	
PPE (Personal Protective Equipment)	Online	1	
Ethics Awareness for Transportation Industry	Online	1	
Instructor Preparation	Online	3	
Transportation Asset Management Overview	Online	2	
Benchmark/Bests Practices for State Equipment Fleet	Online	3	
Best Practices for High Friction Surfaces	Online	3	
Maintenance Storm water Field Guide Training	Online	3	
Maintenance Training Series: Base/Subbase Stabilization &	Online	1	
Maintenance Training Series: Basics of work zone Traffic	Online	1	
Maintenance Training Series: Cultural and Historic	Online	1	
Maintenance Training Series: Outdoor Advertising and Litter	Online	1	
Maintenance Training Series: Pavement Preservation Program	Online	1	
Maintenance Training Series: Roadside Vegetation	Online	1	
Maintenance Training Series: Roadway Drainage	Online	1	
Maintenance Training Series: Shaping and Shoulders	Online	1.5	
Maintenance Training Series: Thin HMA Overlays and Leveling	Online	1.5	
Maintenance Training Series: Underground Storage Tanks	Online	1	
Maintenance Training Series: Weather-related Operations	Online	1	
PCC Pavement Preservation Series: Concrete Overlays	Online	1	
PCC Pavement Preservation Series: Concrete Pavement	Online	2	
PCC Pavement Preservation Series: Diamond Grinding &	Online	2	



PCC Pavement Preservation Series: Full-Depth Repairs	Online	1	
PCC Pavement Preservation Series: Joint Resealing and Crack	Online	2	
PCC Pavement Preservation Series: Load Transfer Restoration	Online	1	
PCC Pavement Preservation Series: Partial-depth repairs	Online	1	
PCC – Preventative Maintenance & Pavement Preservation	Online	1	
PCC Pavement Preservation Series: Retrofitted Edge Drains	Online	1	
PCC Pavement Preservation Series: Slab Stabilization and Slab	Online	1	
PCC Pavement Preservation Series: Strategy Selection	Online	1	
Preventative Maintenance Concepts for State Fleet	Online	3.5	
Trenchless Technology	Online	4.5	

LAST REVISION DATE: 6/18/2020. These requirements may be subject to change.

TESL Training Plan

Minimum of 40 *new* training hours per year to be completed by June 15 for Steps 1-4.

REQUIRED COURSES			DATE
<i>REQUIRED TRAINING (If not already completed at start of step)</i>	TYPE	HOURS	
Year 1			
Behavioral Styles in the Workplace	Instructor-led		
Constructive Culture	Instructor-led		
Constructive Communication	Instructor-led		
Customer Service	Instructor-led		
Project Wise	OJT	4	
ELECTIVES			DATE
<i>TRAINING ELECTIVES</i>	TYPE	HOURS	
General Training			
2.55 Site Manager	Instructor-led	4	
Microsoft Project – Basic	Online	2	
Microsoft Project – Advanced	Online	2	
Project Scheduling System (PSS)	Instructor-led	32	
ITD Project Management Academy 1-4	Instructor-led	40	
132013B NHI Hydraulics and Drainage	Instructor-led	12	
Time Management	Instructor-led	4	
Project Delivery Conference	Instructor-led	12	
Construction Training			
3.07 NPDES Stormwater for Construction Staff & Inspector Qualification	Instructor-led	16	
5.04 Bridge Fundamentals for Technicians	Online	1	
6.01 Aggregate Testing Technician (AgTT) WAQTC	Instructor-led	40	
6.04 Asphalt Testing Technician I (AsTT) WAQTC	Instructor-led	40	
6.05 Asphalt Testing Technician II (AsTT II) WAQTC	Instructor-led	40	
6.07 Concrete Testing Technician (CTT) WAQTC	Instructor-led	24	
6.13 In-Place Density Testing Technician (DTT) WAQTC	Instructor-led	40	
6.10 Embankment & Base Testing Technician (EBTT) WAQTC	Instructor-led	16	
2.22 Contract Administration (CA) IQP	Instructor-led	16	
2.28 Earthwork & Base (E&B) IQP	Instructor-led	16	
2.04 Surface Treatment & Plant Mix Pavement (ST&PP) IQP	Instructor-led	16	
2.16 Concrete & Structures (C&S) IQP	Instructor-led	16	
2.53 Traffic Construction Inspection (TCI) IQP	Instructor-led	16	
Design Training			
<i>Bentley training is listed in the order a new user should complete it</i>			
Bentley Microstation Basics Curriculum	Online	20	
Bentley PowerInRoads OpenRoads – Intermediate 1 Curriculum	Online	11	
Bentley PowerInRoads OpenRoads – Intermediate 2 Curriculum	Online	18	
Bentley PowerInRoads OpenRoads – Advanced 1 Curriculum	Online	11	
Bentley Surveyors/Designers Using PowerInRoads OpenRoads Curriculum	Online	5	

Bentley OpenRoads ConceptStation Curriculum	Online	1	
Bentley Pointools Curriculum	Online	3	
Bentley Subsurface Utility Design & Analysis (SUDA) Curriculum	Online	23	
3.08 NPDES Stormwater for Designers	Instructor-led	8	
380032A NHI Roadside Safety Design	Instructor-led	24	
130101 NHI Intro to Safety Inspection of In-Service Bridges	Online	14	
Leadership Training			
Art of Communication	Instructor-led	4	
Superior Listening	Instructor-led	4	
Team Principles	Instructor-led	4	
Change Principles	Instructor-led	8	
ITD Organizational and Mission Awareness	Instructor-led	3	
Stress Management	Instructor-led	3	
Other Elective Training			
Identify training with supervisor as needed	TBD	TBD	
Additional Online Courses Available via TalentEd			

The classes highlighted above will serve as my development plan for the 20____/20____ performance cycle.

Employee Name

Employee Signature

Date

Manager Name

Manager Signature

Date

TTE Training Plan

The purpose of training in the TTE career path is to close any skill gaps that will prevent a participant from achieving the other career path requirements. To accomplish this, participants in this career path are required to complete a minimum of 40 hours of training per year, outlined on the individual's development plan. The training that is selected for the development plan should be related to the work the employee is doing during that year and should assist them in achieving their metrics, demonstrating their skill, or being qualified to complete the required experience hours.

You can print this appendix to use as a development plan for the current year. Meet with your supervisor to identify appropriate training. This list doesn't limit other trainings that are relevant for an employee's success i.e. FHWA, NHI, etc.

Minimum of 40 new training hours per year to be completed by June 15

ELECTIVES			DATE
TRAINING ELECTIVES	TYPE	HOURS	
General Training			
Behavioral Styles in the Workplace	Instructor-led	4	
Constructive Culture	Instructor-led	4	
Constructive Communication	Instructor-led	8	
Customer Service	Instructor-led	4	
Eight Wastes of Lean	Instructor-led	4	
Time Management	Instructor-led	4	
Annual Operations Conference	Instructor-led	12	
Safety Videos Curriculum	Online	6	
Outlook: Core Class	Instructor-led	4	
Word: Overcoming Things that Drive You Crazy	Instructor-led	4	
Word: The Most Important Word Class You'll Ever Take	Instructor-led	4	
Data Analysis with Microsoft Excel	Instructor-led	4	
Effective Business Writing Workshop	Instructor-led	12	
Intro to Project Management	Online	2	
Project Scheduling System (PSS)	OJT	4	
2.43 Plans and Specifications	Instructor-led	16	
2.55 Site Manager	Instructor-led	4	
4.04 Applied Math for Technicians	Online	2	
4.12 On-the-Job (OJT) Model for Subject Matter Experts (SMEs)	Instructor-led	16	
9.11 First Aid/CPR/AED 2-Year Renewal	Instructor-led	4	
Construction Training			
3.07 NPDES Stormwater for Construction Staff & Inspector Qualification	Instructor-led	16	
3.30 Environmental Awareness	Instructor-led	8	
5.04 Bridge Fundamentals for Technicians	Online	1	
6.19 Nuclear Gauge Safety	Instructor-led	8	
6.40 Properties of Materials	Instructor-led	8	
7.03 Right of Way	Instructor-led	4	
9.02 Defensive Driving	Instructor-led	8	
10.07 Basic Traffic Control	Instructor-led	4	
10.16 Application of Traffic Control Plans	Instructor-led	16	

10.28 General Flagger	Instructor-led	4	
6.01 Aggregate Testing Technician (AgTT) WAQTC	Instructor-led	40	
6.05 Asphalt Testing Technician II (AsTT II) WAQTC	Instructor-led	40	
6.07 Concrete Testing Technician (CTT) WAQTC	Instructor-led	24	
6.13 In-Place Density Testing Technician (DTT) WAQTC	Instructor-led	40	
6.10 Embankment & Base Testing Technician (EBTT) WAQTC	Instructor-led	16	
6.16 Sampler/Tester Exam Administration	Instructor-led	16	
2.22 Contract Administration (CA) IQP	Instructor-led	16	
2.16 Concrete & Structures (C&S) IQP	Instructor-led	16	
2.28 Earthwork & Base (E&B) IQP	Instructor-led	16	
2.04 Surface Treatment & Plant Mix Pavement (ST&PP) IQP	Instructor-led	16	
2.53 Traffic Construction Inspection (TCI) IQP	Instructor-led	16	
Design Training			
<i>Bentley training is listed in the order a new user should complete it</i>			
Bentley Microstation Basics Curriculum	Online	20	
Bentley PowerInRoads OpenRoads – Intermediate 1 Curriculum	Online	11	
Bentley PowerInRoads OpenRoads – Intermediate 2 Curriculum	Online	18	
Bentley PowerInRoads OpenRoads – Advanced 1 Curriculum	Online	11	
Bentley Surveyors/Designers Using PowerInRoads OpenRoads Curriculum	Online	5	
Bentley OpenRoads ConceptStation Curriculum	Online	1	
Bentley Pointools Curriculum	Online	3	
Bentley Subsurface Utility Design & Analysis (SUDA) Curriculum	Online	23	
3.08 NPDES Stormwater for Designers	Instructor-led	8	
Leadership Training			
Art of Communication	Instructor-led	4	
Superior Listening	Instructor-led	4	
Team Principles	Instructor-led	4	
Change Principles	Instructor-led	8	
ITD Organizational and Mission Awareness	Instructor-led	3	
Stress Management	Instructor-led	3	
Other Elective Training			
Identify training with supervisor as needed	TBD	TBD	
Additional Online Courses Available via TalentEd			

The classes highlighted above will serve as my development plan for the 20____/20____ performance cycle.

Employee Name

Employee Signature

Date

Manager Name

Manager Signature

Date



Transportation Technician, Engineering (TTE) Step 1 Completion Checklist

Employee Name:	
District/Unit:	
Supervisor:	

Purpose: This form serves to document the increased knowledge, skill, training, performance and constructive behavior gained by the employee to support their completion of Step 1 of the Transportation Technician, Engineering Horizontal Career Path.

Criteria		Pass/Fail	Supervisor's Initials
Knowledge/Experience			
	200 hours of design time codes		
	200 hours of construction time codes		
	600 hours total combined design/construction codes		
Skills			
	Completion of two WAQTC courses or entry level Bridge Hydraulics course		
	Completion of two IQP courses or Introduction to Bridge Inspection Class		
	Completion of Beginner MicroStation test		
	Completion of Proctored ProjectWise test or Bridge Standards and Documentation test		
Training			
	Completion of a minimum of 40 hours training		
Performance			
	Met Performance Metric goal as outlined on the COO memo		
Constructive Behavior			
	Rated at least "Achieves Performance Standard" in Annual Performance Rating		

Supervisor Printed Name

Supervisor Signature

Date



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Your Economic Opportunity**

Transportation Technician, Engineering (TTE) Step 2 Completion Checklist

Employee Name:	
District/Unit:	
Supervisor:	

Purpose: This form serves to document the increased knowledge, skill, training, performance and constructive behavior gained by the employee to support their completion of Step 2 of the Transportation Technician, Engineering Horizontal Career Path.

Criteria		Pass/Fail	Supervisor's Initials
Knowledge/Experience			
	200 hours of design time codes		
	200 hours of construction time codes		
	600 hours total combined design/construction codes		
Skills			
	Completion of all WAQTC courses or entry level Bridge Hydraulics course		
	Completion of all IQP courses or Introduction to Bridge Inspection Class		
	Completion of Intermediate MicroStation test		
	Completion of Intro to Project Management Online Course		
	Completion of District Level Presentation of Learning		
Training			
	Completion of a minimum of 40 hours training		
Performance			
	Met Performance Metric goal as outlined on the COO memo		
Constructive Behavior			
	Rated at least "Achieves Performance Standard" in Annual Performance Rating		

Supervisor Printed Name

Supervisor Signature

Date



**Your Safety • Your Mobility
Your Economic Opportunity**

Transportation Technician, Engineering (TTE) Step 3 Completion Checklist

Employee Name:	
District/Unit:	
Supervisor:	

Purpose: This form serves to document the increased knowledge, skill, training, performance and constructive behavior gained by the employee to support their completion of Step 2 of the Transportation Technician, Engineering Horizontal Career Path.

Criteria		Pass/Fail	Supervisor's Initials
Knowledge/Experience			
	200 hours of design time codes		
	200 hours of construction time codes		
	600 hours total combined design/construction codes		
Skills			
	Completion of State Level Presentation of Learning		
Training			
	Completion of a minimum of 40 hours training		
Performance			
	Met Performance Metric goal as outlined on the COO memo		
Constructive Behavior			
	Rated at least "Achieves Performance Standard" in Annual Performance Rating		

Supervisor Printed Name

Supervisor Signature

Date