



Recruiting, Retaining, and Promoting for Careers at Transportation Agencies

Project No. 17PPLSU07

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Addressing Region 6 Transportation Needs

**Final Report
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16. Abstract State transportation agencies currently face complex challenges in recruiting and retaining the workforce necessary to function effectively. The situation exacerbates due to the number of employees from different generations that have to coexist with varying values, expectations, and principles. These agencies are primarily comprised of two generational groups: the baby-boomers, who are approaching retirement and occupy many managerial positions; and the millennials, who are demonstrating their interest in technology and demanding dynamism in their careers. This multiplicity of interest represents a challenge for human resources (HR) in addressing workforce issues and providing the necessary means to recruit and retain qualified employees within a transportation agency. Therefore, the purpose of the study is to examine the practices in recruiting, training, and retaining qualified employees at state departments of transportation (DOTs) primarily from Region 6 DOTs of Arkansas, Louisiana, New Mexico, Oklahoma, and Texas. A comprehensive literature review, including journal articles, books, and District 6 DOT documents, reports, and training manuals provided the basis to discuss current practices in recruitment and retention with Region 6 DOT human resources (HR) staff. A total of nine HR professionals were interviewed for this study. These interviews identified the most difficult to fill positions as engineers and engineer technicians. These positions also have high turnover rates within DOTs. The primary difficulty in retaining and recruiting staff in these positions was ascribed to the wage differences between the public and the private sector. The results of the HR interviews were used to compile a questionnaire that was distributed to current DOT District 6 employees. A total of 1,109 employee surveys were collected and reviewed to develop a recommended list of best practices for recruiting and retaining DOT employees. The list of best practices includes increased social media presence, quantification of overall benefit packages, implementation of flexible work schedules and telecommuting, clarification and restructuring of the promotions and incentives process, and increased communication and feedback between staff and management.					
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APPROXIMATE CONVERSIONS TO SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
LENGTH				
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
AREA				
in ²	square inches	645.2	square millimeters	mm ²
ft ²	square feet	0.093	square meters	m ²
yd ²	square yard	0.836	square meters	m ²
ac	acres	0.405	hectares	ha
mi ²	square miles	2.59	square kilometers	km ²
VOLUME				
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liters	L
ft ³	cubic feet	0.028	cubic meters	m ³
yd ³	cubic yards	0.765	cubic meters	m ³
NOTE: volumes greater than 1000 L shall be shown in m ³				
MASS				
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams (or "metric ton")	Mg (or "t")
TEMPERATURE (exact degrees)				
°F	Fahrenheit	5 (F-32)/9 or (F-32)/1.8	Celsius	°C
ILLUMINATION				
fc	foot-candles	10.76	lux	lx
fl	foot-Lamberts	3.426	candela/m ²	cd/m ²
FORCE and PRESSURE or STRESS				
lbf	poundforce	4.45	newtons	N
lbf/in ²	poundforce per square inch	6.89	kilopascals	kPa

APPROXIMATE CONVERSIONS FROM SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
LENGTH				
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
m	meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
AREA				
mm ²	square millimeters	0.0016	square inches	in ²
m ²	square meters	10.764	square feet	ft ²
m ²	square meters	1.195	square yards	yd ²
ha	hectares	2.47	acres	ac
km ²	square kilometers	0.386	square miles	mi ²
VOLUME				
mL	milliliters	0.034	fluid ounces	fl oz
L	liters	0.264	gallons	gal
m ³	cubic meters	35.314	cubic feet	ft ³
m ³	cubic meters	1.307	cubic yards	yd ³
MASS				
g	grams	0.035	ounces	oz
kg	kilograms	2.202	pounds	lb
Mg (or "t")	megagrams (or "metric ton")	1.103	short tons (2000 lb)	T
TEMPERATURE (exact degrees)				
°C	Celsius	1.8C+32	Fahrenheit	°F
ILLUMINATION				
lx	lux	0.0929	foot-candles	fc
cd/m ²	candela/m ²	0.2919	foot-Lamberts	fl
FORCE and PRESSURE or STRESS				
N	newtons	0.225	poundforce	lbf
kPa	kilopascals	0.145	poundforce per square inch	lbf/in ²

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ACRONYMS, ABBREVIATIONS, AND SYMBOLS

AASHTO	American Association of State Highway and Transportation Officials
AR	Arkansas
ArDOT	Arkansas Department of Transportation
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
CDL	Commercial Driver’s License
CFISD	Cy-Fair Independent School District
CE2I	College of Engineering Enhancement Institute
DOT	Department of Transportation
HR	Human Resources
IT	Information Technology
ITE	Institute of Transportation Engineers
LA	Louisiana
LaDOTD	Louisiana Department of Transportation and Development
LSC	Lone Star College at Cy-Fair
LSU	Louisiana State University
LTAP	Local Technical Assistance Program
NM	New Mexico
NMDOT	New Mexico Department of Transportation
NSTI	National Summer Transportation Institute
ODOT	Oklahoma Department of Transportation
OK	Oklahoma
PVAMU	Prairie View A&M University
RIDES	Roadways in Developing Elementary Students
RII	Relative Importance Index
STEM	Science, Technology, Engineering, and Mathematics
STI	Summer Transportation Institute
TCRP	Transit Cooperative Research Program

TRAC	Transportation and Civil Engineering
Tran-SET	Transportation Consortium of South-Central States
TRB	Transportation Research Board
TTI	Texas Transportation Institute
TX	Texas
TxDOT	Texas Department of Transportation
UNM	University of New Mexico
USDOT	United States Department of Transportation
UTC	University Transportation Center

EXECUTIVE SUMMARY

Construction is a labor-intensive industry, meaning that employees are the most valuable resource for construction firms and organizations. Challenges exist in today's workforce regarding recruiting and retaining quality employees as well as attracting individuals from minority and underrepresented groups. Currently, the aging workforce of the United States, along with the acknowledgment that newer generations of potential transportation workers have many different ideals, beliefs, and expectations than previous generations, necessitates that recruitment and retention issues should be a primary concern for public transportation organizations such as state departments of transportation (DOTs). Gone are the days when companies would hire individuals who would spend their entire career at the same company.

Smart, ambitious, and highly motivated employees are difficult to find and even more challenging to keep, especially when considering individuals for technician positions such as DOT engineers, engineering technicians, maintenance personnel, and information technology professionals. These difficulties are not just a construction industry problem, but a more widespread issue for industries that require career technical education fields. Qualified personnel must be well-compensated and provided work that develops their skills and matches their interests. Since engineering and technical employees require challenging and rewarding work, strategic hiring and retention plans must be employed to recruit and retain each of these types of workers successfully.

In order to manage the dynamics of meeting the needs of both the future and today in both construction and maintenance while dealing with a shrinking and changing workforce, state DOTs need robust workforce management strategies and guidance that can attract, train, retain, and promote the personnel needed to construct and maintain the U.S. highway infrastructure now and into the future. Therefore, this study focuses on the current state of recruiting and retention practices of state DOTs found in Region 6. To address the concerns of recruiting and retaining high quality and highly valued employees, the following are the objectives of this research project:

- 1. Determine the best practices employed by transportation agencies, other public agencies and organizations, and private firms that lead to recruitment of qualified transportation agency employees,*
- 2. Assess current best practices that are used to retain qualified and experienced transportation agency employees,*
- 3. Identify potential institutional barriers that exist within transportation agencies that limit the recruitment and retention of high-quality employees, and*
- 4. Develop outreach, educational, and workforce development hands-on activities to expose, and engage bright young minds from underrepresented groups to broader fields of transportation and the associated careers.*

To accomplish the research objectives, the research team developed recommendation strategies that state DOTs can adopt and implement to help improve current recruiting and retention practices. One can expect that the recommendations benefit state DOTs by helping them find better recruits, offering employees what they want, and keeping quality employees' long term. The research team used the following research plan:

- Phase I: Technical Phase
 - Task 1-1: Conduct a literature review
 - Task 1-2: Review current state of practice

- Task 1-3: Identify institutional barriers
- Task 1-4: Identify the need
- Task 1-5: Make recommendations
- Task 1-6: Develop and submit final deliverables
- Phase II: Implementation Phase
 - Task 2-1: Workforce development
 - Task 2-2: Outreach activities
 - Task 2-3: Education programs

The research team completed an extensive literature review of recruiting, retention, and training practices for transportation employees by reviewing documents, reports, journal articles, and guidebooks related to the transportation and construction industries. Further, the team investigated recruiting and retention practices in other related industries such as business and manufacturing. An annotated bibliography was put together to summarize the primary literature documents used in this study. Then, a content analysis was completed using Region 6 DOT manuals and documents related to recruiting, retention, and training.

Using the annotated bibliography and the content analysis, the research team developed and piloted an interview questionnaire, designed to be used with DOT staff. Then, the research team at conducted nine interviews with human resources (HR) staff at the DOTs in Arkansas (ArDOT), Louisiana (LaDOTD), New Mexico (NMDOT), Oklahoma (ODOT), and Texas (TxDOT), which included HR directors, talent acquisitions coordinators, personnel officers, and recruitment specialists. Each interview took approximately 30 to 45 minutes, and all interviews took place as a conference call with the exception of LaDOTD, which was conducted face to face. The interviews allowed the research team to have detailed discussions with DOT staff that specifically work in HR and handle the day-to-day tasks related to recruitment and retention.

Then, using the annotated bibliography, content analysis, and HR interview findings, the research team established a survey questionnaire. The questionnaire, created using the online survey program Qualtrics and distributed electronically, included 40 questions and took approximately 15 minutes to complete. Using the HR contacts from the interviews, the HR department at ArDOT and ODOT distributed the survey department-wide. Due to changes in the HR structure within the state of New Mexico government employees, NMDOT had a relatively small sample of current employees respond to the survey questionnaire. Then, due to the impacts of Hurricane Harvey on the State's transportation system, TxDOT HR staff did not respond to survey distribution requests. The research team then used a TxDOT online directory to collect responses. Finally, the LaDOTD declined to distribute the survey. A total of 1,109 responses were collected and used in the analysis to develop the recommendation strategies.

In analyzing the literature collected, the findings from the interviews, and the survey data, the research team discovered that state DOTs in Region 6 have similar issues with trying to find and keep quality employees. The primary findings of this research are:

Salary compensation: As expected, state DOTs cannot compete with other businesses, especially those in the private sector, regarding salary offers and compensation. This research noted that the positions of engineers, equipment operators, maintenance personnel, surveyors, and inspectors are difficult positions to fill as private firms offer more money for these positions. However, state DOTs are using other tools to overcome this difference, such as ArDOT quantifying the benefits

offered along with the salary to recruits to show them that their salary, along with benefits, is on par with private companies. LaDOTD uses a unique entrance pay system that provides incoming recruits with a higher salary than the minimum for that job classification. Other tools include offering flexible work weeks that LaDOTD and ODOT provide for its employees, annual bonuses and special recognition compensation used at TxDOT, and the use of other incentives such as training programs, work-life balance, education assistance, and a plethora of health and retirement benefits that typically outmatch private firms' benefits.

Recruitment strategies: In discussions with Region 6 DOT HR staff, there are many different strategies and tools used to help with recruitment efforts. Recruitment is a multidimensional and complicated process; yet, state agencies share common approaches to recruiting qualified personnel. The agencies communicate the excellent benefits offered by state employment and four of the five Region 6 DOTs embrace the use of websites and social media for recruiting efforts to reach a broad younger audience. Also, the state DOTs regularly participate and engage in job fairs at various universities and colleges in the southern U.S. to actively recruit potential applicants and hire underrepresented minorities to promote diversity. In reviewing the factors that influence employees to join DOTs, the employees from the four states replying to the survey had the following priorities for recruitment: health benefits, retirement benefits, and stable employment.

DOT operational differences: Although state DOTs share similar characteristics, and activities and perform similar work, they differ in many elements. The five state DOTs studied have a high degree of diversity concerning size, jurisdictional responsibilities, political organization, demographic characteristics, turnover positions, and professional profile. State DOTs must adapt to internal and external social, economic, and political factors. As different as they are, transportation agencies face complex workforce issues that are exacerbated by the high levels of anticipated retirements and the need for new workforce skills required to face advanced technologies. An average of the overall trend in all four states shows that about 34% of state employees are already eligible or will be eligible to retire within the next five years.

Generational differences: There are three generations currently working for DOTs: Baby Boomers, Generation Xers, and Millennials. It is important to note that the different generations is an important aspect of recruiting, retention since the millennial generation is currently the largest cohort in the United States workforce, and more than 50% of DOT employees are over the age of 45. As a result of these generations and associated generational difference, the organizational structures for DOTs are being redefined in respect to authority, workload, work schedules, and work ethic. Also, generational differences are affecting different dimensions of HR practices including recruitment, employee motivation, and retention. Managing a diverse workforce demands an inclusive approach, which integrates the value systems of all groups. When discussing with Region 6 DOT agencies about the actions that each carried out in this regard, most agreed that to attracting and retaining talent, development and learning opportunities within the department are essential, as well as offering competitive compensation and career opportunities without discounting flexibility practices and leadership styles aligned with the profiles sought.

Retention Strategies: A prominent theme expressed by all the HR staff interviewees is that state DOTs currently experience high turnover rates among the positions of engineers and maintenance professionals. HR staff cited competitive labor-market conditions as a critical contributor to the difficulty in recruiting and retaining employees for critical engineering and field personnel positions. The constrained budget of public agencies restricts them from providing higher or

similar salaries to those of the private sector. There were strong indications from the employees responding to the survey that better salary opportunities and promotion opportunities were the primary incentives when considering private-sector employment. However, state DOTs providing special compensation or bonus programs can potentially retain employees more successfully than those where such options do not exist. As a result, DOTs implement holistic recruitment and retention strategies that entice and persuade different generations of the benefits and potentials they would gain by working in the transportation agency. The use of incentives, such as quantifying the total benefits package along with a salary, shows that DOTs can offer similar compensation packages as the private sector.

Based on the findings, the research team developed recommendations for state DOTs to implement to improve current practices for recruiting, hiring, retaining, and promoting highly valued and quality employees. The recommendations are:

- *Use Social Media and Internet Sources:* DOTs should consider having a social media presence for advertising and recruiting individuals to work for the agency as well as to note positive and encouraging information from the DOT to improve loyalty and retention.
- *Quantify Offered Benefits along with Salary:* Include a quantified value of benefits along with the starting salary to be on par with private sector firms. In many cases, DOTs offer better benefit packages that include more incentives and options than private firms can offer. So, by quantifying the benefits along with the offered salary provide a quantitative compensation amount that is comparable to salary offers from private firms.
- *Offer Flexible Work Schedules:* Provide the option to employees to work a flexible 40-hour per week schedule to balance work and life. By offering employees a more flexible work schedule, such as working ten-hour days for four days a week, employees can still perform their duties, but using a schedule that fits their life better than a traditional five-day work week.
- *Base Promotions and Incentives on Employee Performance:* Conduct and review employee performance evaluations for possible promotion and incentives to award high performing and effective employees. Although this is most likely a process already in place at state DOTs, it is important to point out that the survey of current DOT employees indicates that employees believe that performance is not the reason that some people receive bonuses or promotions. In fact, some of the survey responses noted that they believe subjectivism, favoritism and family/friends of supervisors receive incentives regardless of their performance. It would be ideal for state DOTs to develop formal processes for each level of employment so that employees receive incentives and promotions more objectively.
- *Improve Morale Department-Wide:* High morale among employees can create a productive and enjoyable workforce that can entice potential employees to work for the DOT and to keep current employees from leaving. Discussions with current DOT staff and the survey findings show that morale at state DOTs is lower than expected. Also, many responses to the survey noted that improved working conditions would be helpful for them to consider staying at the DOT until retirement. DOTs need to promote a more favorable appearance and invoke supervisors and managers to improve the culture and morale, which in turn results in more loyalty from current employees.

- *Promote the Importance of Working for a Public Agency:* Highlight to recruits the importance and job satisfaction one achieves by working for a public transportation agency. Working for a public agency makes employees public servants, which can be enticing to some people that want to help improve our society.
- *Require Employees that Obtain a License to Remain with the DOT:* A concern among DOTs that exists today is that some positions require employees to obtain a license to perform the job. Entry-level employees may not possess the necessary licenses, so the DOT supports and pays for them to obtain what they need. The problem is that once an employee receives the license, they tend to leave the DOT for another firm that can pay a higher rate than the DOT. Although DOTs typically require employees to work for the DOT for a set period of time if the DOT provides education assistance, this does not seem to be the case for individuals that obtain a license, such as a commercial driver's license to operate heavy equipment.

IMPLEMENTATION STATEMENT

To disseminate the results and findings from this Tran-SET UTC research project, the research team plans to implement a variety of activities related to workforce, outreach, and education. The focus is to relay the results and recommendations to state DOTs as well as to encourage elementary through college students to consider careers in transportation and working for a DOT.

For workforce development, the research team at Louisiana State University (LSU) has developed a presentation for a possible webinar and a seminar with the Region 6 LTAPs. The webinar summarizes the research project as well as details the findings and recommendation strategies. The audience for the webinar is state DOT HR personnel and possibly be a live webinar as a part of the Tran-SET Webinar series. Additionally, the Tran-SET website can provide a downloadable recorded version of the webinar. There is a possibility that the research team can work with state DOT to formulate the webinar into a workforce seminar, offered through the LTAPs located in Region 6.

Then for outreach, to gain a general and large audience for disseminating the results, the research team prepared a conference paper and made a presentation to an international audience at the World Transport Conference in Beijing, China in June 2018. The research team has also prepared and gave a presentation to the AASHTO Committee on Construction Annual Meeting in August 2018. Further, the research team developed an extended abstract for presentation at the 97th TRB Annual Meeting. Further, the research team has a full peer-reviewed journal article in development, which will be submitted for publication in early 2019.

To encourage younger individuals about transportation careers, the research team at Prairie View A&M University (PVAMU) organized two educational outreach activities to promote the work performed by state DOTs, and the University of New Mexico (UNM) participated in the Summer Transportation Institute (STI). The first activity planned by PVAMU targeted K-5 students while the other activity focused on incoming engineering college freshman. UNM conducted activities for the STI that focuses on high school students. The goal of these outreach activities was to create interest in the broader field of transportation by engaging them with hands-on activities that are suitable for their age group.

The research team at PVAMU and UNM have been involved with and hosted STI programs for high school students for many years. Building on that experience the team-building activity modules that are not only educational but also generate curiosity and interest for the broader field of transportation and the different careers that this field supports. The research team considered using AASHTO's Transportation and Civil Engineering (TRAC) and Roadways in Developing Elementary Students (RIDES) educational outreach programs, which provides resources to perform hands-on activities related to bridge design, city planning, design and construction, environmental engineering, highway safety, magnetic levitation, motion, and traffic technology.

The K-5 student's outreach activities conducted by PVAMU for summer of 2018 included a hands-on transportation workshop for K-5 students offered at a local community college, Lone Star College at Cy-Fair (LSC), located about 25 miles away from PVAMU, which covers the northwest part of Houston, TX. The location was chosen to impact a large population of the area, which is home to Cy-Fair Independent School District (CFISD), one of the largest school districts in the country with a student population more than 100,000. The target population was elementary school level (K-5) students. LSC collaborated with PVAMU for these K-5 activities. The activities

planned covered half a day, and they included a brief and engaging presentation followed by several hands-on activities.

The freshman education outreach activity targets incoming college freshman interested in engineering programs at PVAMU. PVAMU has been offering the Roy G. Perry College of Engineering Enhancement Institute (CE²I) for many years now. The objective of this program is to introduce incoming freshman to the concepts of Science of Technology, Engineering and Mathematics (STEM) and how these concepts are used in our daily life and motivate them to be successful engineering students and eventually engineers. The program was a five-week summer bridge to college program intended to prepare students for the rigor of a pursuing a STEM major. The team developed three modules that focused on transportation-related hands-on activities. These activities improved their understanding of the role of transportation in everyday life and promote transportation field as a potential career. The CE²I program took place in late June/early July 2018.

UNM engaged high school level students by participating in the UNM STI program during the summer of 2018. The STI, which UNM also participated in during the summer of 2017, has a goal of encouraging high school students to pursue careers in the transportation industry. The Structural Engineering and Materials Lab at the Department of Civil Engineering developed a workshop to teach the STI students how to test the behavior of metals (steel and aluminum) and timber; how to evaluate concrete aggregates, Portland cement, and Portland cement concrete; and how to test asphalt binders and hot mix asphalt for pavement.

1. INTRODUCTION

A safe, efficient, and effective transportation system is essential for the growth and stability of the economy and the lifestyle of its inhabitants (1). The effectiveness of the transportation infrastructure and service industry depends heavily on the ability to recruit and retain a highly skilled and qualified workforce. State departments of transportation (DOTs) face various challenges in recruiting and retaining the workforce necessary to function effectively (2). Some of the reasons for these challenges include demographic changes in the workforce, competitive labor market, new technologies, and the overall demand on the transportation industry (3).

As more experienced transportation employees continue to retire and take their knowledge and experience with them, DOTs face a staffing dilemma. Losing years of knowledge and experience is a considerable resource loss for a state DOT. In addition, newly-hired DOT personnel, such as engineers and engineer technicians, do not possess the knowledge and experience to replicate the outgoing employees. Further compounding the issue is that, in many cases, once new employees gain valuable knowledge and experience at a DOT, they leave the DOT for private firms and other organizations that offer more than what DOTs can offer, such as higher salaries and better opportunities for promotions (4).

Many public agencies also struggle to maintain technical career paths that reward and support the development and retention of staff with valuable skill areas. When an employee leaves, state DOTs suffer negative impacts such as lost investments in training, loss of experience, critical skills loss, and costs corresponding to the replacement of leaving employees. It is imperative to hire and retain employees for the long term, as they are instrumental in imparting the institutional knowledge needed to manage and operate respective transportation agencies and address any expanded agency missions over time. The demand for transportation construction, reconstruction, and maintenance work continue to increase annually, and thus, the demand for qualified personnel is also increasing for the entire construction industry including state transportation agencies.

The difference between older and younger generations has become a driving concern to human resource professionals as they prepare to manage the rapid demographic shifts expected in the transportation construction workforce (5). According to the Transportation Research Board's 275 Report (2), more than 50 percent of the state transportation agency workforce already are or will be eligible to retire soon, which is double the rate for the United States' entire workforce. As the retirement of the older generations increases, Millennials are rapidly becoming the largest cohort of the transportation industry workforce (5). The loss of experienced employees can result in core competency gaps needed for the performance of specific job-related duties and responsibilities.

In addition to the demographic changes in the workplace, employee perceptions, values, and work ethics are also changing (4). Several studies recently indicated that Millennials place more value on work-life balance and leisure and seek more flexible and challenging work than their older generations counterparts (6). Conversely, Millennials show higher levels of job mobility than recent previous generations (5). Although younger generations of workers' report "higher levels of job satisfaction and less desire to leave their jobs" (5, p.44), they are willing to relocate across their workplace organization in search of professional development. Further, Millennials are interested in job security and stability. However, Millennials seem reluctant to work for public transportation agencies, which Millennials perceive as non-innovative and lacking exciting work (5).

State DOTs compete both with private sector transportation construction firms and with other public sector agencies for workers at all levels of experience (7). Although state DOTs commonly offer employees stable work and a variety of benefit packages, recruitment, and retention of qualified workers is challenging due to strong incentives offered in the private sector and other fields such as higher salaries and promotional opportunities (3). Transportation agencies typically provide lower wages compared to the private sector, yet DOTs can offer various benefits to offset the pay disparity (8).

The skills, means, and methods required of the transportation agency workforce change as a result of technological innovation (9). Technology enables transportation agencies to improve functions in planning, operating, and managing projects (10). However, increasing the use of technology can positively or negatively influence recruitment and retention efforts. Although technology exploits efficiency and productivity, it may drive older generation employees out of the workforce as the job requires more technical skills, but conversely could help DOTs retain newer generation employees that are more technologically skilled.

Many previous studies of transportation agencies have been conducted to understand the issues associated with workforce recruitment and retention. The main challenges identified include the high levels of agency retirements from the baby boomer generation and the natural need for high-quality employees. On average, the private sector offers higher salaries than the public sector. As a result of wage disparities, engineering and technical positions are subject to rapid turnover at the DOT. Furthermore, the transportation workforce is composed of employees from many distinct generations. The tastes, values, desires, expectations, and ways of learning of these individuals are different. Embracing these generational differences represents a challenge as the work environment may encounter productivity challenges.

With an effort at improving recruitment and retaining initiatives within state DOTs, a wide variety of practices are recommended to attract and maintain potential employees. Transportation agencies can offer many attractive attributes to current and future employees such as job security and stability, opportunities for professional development, flexible schedules, and work-life balance. In this sense, this investigation seeks to assess the practices in recruiting, training, and retaining qualified employees at state DOTs, specifically from Region 6 DOTs (Arkansas (AR), Louisiana (LA), New Mexico (NM), Oklahoma (OK), and Texas (TX)).

Recruitment and retention programs for professionals are essential to the success of a state DOT (2). Given the workforce challenges mentioned, this research examines Region 6 state DOTs current and future transportation workforce issues by evaluating employee recruiting and retention strategies and identifying the practices that have the potential for success and implementation at public transportation agencies.

1.1. Literature Review

Recruitment and retention of quality and highly valued employees at the professional level has become a problematic aspect that transportation agencies across the United States currently face. An investigation by TTI identified two critical workforce issues: the retirement of an aging generation and the growing need for employees with technical skill sets (7). Other factors that contribute to workforce challenges are the dynamic nature of construction work, a changing economy, compensation restrictions for public agencies, and the overall organizational HR philosophy (11).

Overall, work shortages are a growing concern in the construction industry. One study concluded that many areas of the United States currently lack enough numbers of qualified craft workers (12); a recent national workforce survey noted that 74% of construction firms struggle to fill craft worker positions (13). As an example, the Mississippi River Delta Basin area in southern Louisiana currently has \$80 billion worth of new industrial projects ongoing or in planning stages. Many of these projects have had to deal with increased schedule durations due to a lack of skilled craft workers and engineers, as forecasters in 2014 stated that these new plant facilities would require almost 87,000 more craft workers and engineers than are currently available (14). The resulting lack of workers, along with the fact that some of the craft workers that are available may not possess high-quality skills, means that these industrial projects take longer to complete and cost more. The effect on the owner is that the facility cannot be brought online as planned, which then leads to loss of revenue due to the facility not operating as it should and when it should.

In a recent study, Bigelow et al. (13) distributed a survey to 429 drywall and electrical construction workers located in TX. Drywall and electrical workers were chosen to represent the non-union trades (drywall) and unionized trades (electrical workers). The purpose of this study in Texas was that construction has a high potential for work shortages due to the oil and gas industry, and in booming times for oil, construction companies cannot offer the same pay rates. Overall, the study found in the responses that the top recruiting factors were salary and wages, available training, influence from family, and available career opportunities. The highest ranked retention tools for both drywall and electrical workers was the available training to advance their career and associated salary (13). As a recent study, the findings show a common trend: salary and compensation are the driving forces for why people want to work for a company and why people leave those companies for another.

Not only are tradespeople and construction workers in demand, but the reduction of construction management and engineering positions due to the Great Recession of 2008-2011 has also only recently rebounded to levels seen before the recession, even with the current boom in the economy (15). Further, based on information from Humphrey and Bigelow (16), the 2014 employment of construction and project managers was still 14% below 2007 levels. Many project management positions are being left unfilled due to a lack of qualified and educated individuals to fill positions such as field engineers, project managers, site superintendents, estimators and design specialists (16). Many construction firms face an extraordinary demand for attracting and keeping high-quality management personnel, which is even more complicated for DOTs as typically public agencies cannot compete with the salary compensation that private firms offer.

Employment among civil engineers, which represents a large percentage of DOT employees, will increase by 11% between 2016 to 2026 based on current projections (15). This growth rate is higher than the average for other similar occupations for the same period. The report indicates that in 2016 there were approximately 303,500 civil engineers employed in the United States and that the number could increase to almost 335,700 by 2026. However, recent college and university enrollment trends suggest that the number of degrees in civil engineering is entering a period of growth slower than the projected 11% (17). This supply may not be adequate to satisfy the demand. The lack of engineers can potentially impact the quality of the U.S. transportation system, which can then compound and affect the overall national economy (18).

Another issue that DOTs deal with today are the demographic changes in public transportation agencies, which has created a diverse and multi-generational workforce composed of Baby

Boomers, Generation Xers, and Millennials. As the baby boomer generation continues to retire, the proportion of Millennials continues to increase and recently has become the largest generational cohort within the transportation workforce (5, 19). The work environment may encounter productivity challenges if changes are not made to integrate employees with different attitudes and expectations (20). In a study aimed to enhance recruitment and retention rates, researchers identified significant generational differences in worldviews, attitudes towards authority, and perspective on work among employees and managers (21). As presented in Table 1, Baby Boomers respect authority and hierarchy in the workplace and live to work. On the contrary, Generation Xers work to live and rebel against authority. The millennial generation trusts in centralized authority and believes in collective action. Regarding organizational commitment, Baby Boomers, Generation Xers, and Millennials find job satisfaction if the workplace culture is positive (20). Each successive generation values leisure more with an increased desire for jobs with more vacation and less desire for overtime work (5).

Table 1. Workforce characteristics of three generations (5, 21).

	Baby Boomers	Generation X	Millennials
Born	1946 and 1964	1965 to 1980	1980 to 2000
Key Characteristics	<ul style="list-style-type: none"> • Loyal 	<ul style="list-style-type: none"> • Managerial skills 	<ul style="list-style-type: none"> • Tech-savvy
Work Ethic and Values	<ul style="list-style-type: none"> • Respect authority and hierarchy • Values/Morals 	<ul style="list-style-type: none"> • Rebel against authority • Conservative/Traditional 	<ul style="list-style-type: none"> • Trust centralized authority • Liberal/Tolerant • Collaborative
Organizational Commitment	<ul style="list-style-type: none"> • Job satisfaction 	<ul style="list-style-type: none"> • Job satisfaction 	<ul style="list-style-type: none"> • Job satisfaction
Career Goals	<ul style="list-style-type: none"> • Build a stellar career 	<ul style="list-style-type: none"> • Build a portable career 	<ul style="list-style-type: none"> • Build parallel careers
Feedback and Rewards	<ul style="list-style-type: none"> • Sensitive to feedback • Willing to wait for promotions and rewards 	<ul style="list-style-type: none"> • Desire regular feedback • Immediate recognition through title, praise, promotion, and pay 	<ul style="list-style-type: none"> • Need constant feedback • Performance appraisal
Work-life Balance	<ul style="list-style-type: none"> • No balance • Live to work 	<ul style="list-style-type: none"> • Balance • Work to live 	<ul style="list-style-type: none"> • Balance

The retirement of the baby boomer generation is one of the primary challenges transportation organizations are facing in recent times (2, 3, 22). As reported by U.S. Office of Personnel Management (23), Table 2 shows the change in retirement age across the five states included in Region 6. For New Mexico, the average retirement age increased by 2% From 2014 to 2016. Conversely, for Arkansas, the average retirement age decreased by 1% from 2014 to 2016. Although the average retirement age varies, the information shows that most individuals that work for public agencies retire around the age of 60 years old, which is younger than others that work for other agencies or private firms.

Table 2. The average retirement age for public agency employees by state.

State DOT	2014	2015	2016	Increase %
Arkansas	61.4	60.9	60.7	-1.14
Louisiana	60.7	60.3	61.1	0.66
New Mexico	60.9	61.5	62.1	1.97
Oklahoma	60.4	60.5	61.2	1.32
Texas	61.0	61.2	61.4	0.66

Retiring or retired personnel at all levels are the individuals who possess specialized knowledge gained from extensive experience and historical perspectives, which DOTs see as essential for the efficient and effective operation of a public agency (24). More than 42% of workers ages 55 and older are in management, professional, and related occupations (25). Further, the age group of 50-54 years represents the largest contingency of transportation employees, accounting for 20% of the workforce (23). There is a loss of highly skilled personnel coming, and this results in impending competency gaps to perform specific critical tasks correctly within the next ten years. However, for financial reasons and professional satisfaction, many experienced workers are prolonging their working lives beyond the typical retirement age (26), as seen in the increases across four of the five states in Table 2. The increase in retirement age might be beneficial to state DOTs to keep experienced and well-skilled employees longer.

To address current and forthcoming labor shortages, public transportation agencies need to pursue a comprehensive and cohesive approach to building a sustainable workforce that focuses on three primary human resource processes: recruitment, training and development, and retention (9). Each of these processes is described in the following sections.

1.1.1. Recruitment

Employees are the most valuable asset to organizations as they provide the knowledge, skills, perspectives, values, and attributes to the organizational life (27). The process of recruitment helps in, “determining the desired candidate pool, seeking out appropriate candidates, promoting job vacancies, and selecting/hiring individuals into the organization,” (9, p. 4). Recruitment is multidimensional and complex, and no single strategy works for all job classifications. Table 3 shows some effective recruitment strategies and incentives collected from the literature review.

Table 3. Common recruitment strategies used by state DOTs.

Recruitment Strategies	
• Salary opportunities	• Formal training programs
• Health benefits	• Flexible work schedule / telecommuting
• Retirement benefits	• Work-life balance opportunities
• Vacation / leave	• Workforce diversity
• Promotion opportunities	• Stable employment
• Professional development opportunities	• Public service work
• Education assistance	

There are two primary approaches for attracting and selecting candidates; namely, internal and external recruitment. Internal recruitment is the process whereby the employees who have the

knowledge, skills, abilities, and relevant experience are recruited and promoted from within the organization (8). Conversely, external recruitment is the process in which the hiring is done using outside sources (28). Organizations that recruit externally for individuals with the specific skills or characteristics that the firm needs can decrease promotion opportunities for internal workers and thus adversely affect their incentives (28). On the other hand, other researchers noted that filling vacancies in transportation agencies with current employees can have significant benefits as it reduces the cost of external recruitment and training and increases retention (8).

DOTs are at a disadvantage in competing for hiring and then keeping engineering graduates as quality engineering personnel (29). According to the 2012 salary survey conducted by the American Society of Civil Engineers (ASCE) and the American Society of Mechanical Engineers (ASME), state-employed engineers received less than the average income of engineers. The average annual salary of state employees was \$88,000, while the median income for civil engineers was \$103,500. Further, those employed by the petroleum and natural gas industry had a median income of \$135,500, which is \$50,000 more on average than state engineering employees. Transportation agency salaries are unsurprisingly lower than those of the private-sector (38).

As additional evidence, in an article by Off (30), a market study was conducted with the Oklahoma DOT (ODOT) and showed that some employees earned much less than their counterparts in the private sector and neighboring state DOTs. On average, ODOT employees averaged 16% less in salary than their market value. From 2005 to 2007, ODOT experienced a high turnover rate of about 10%. However, in 2008 the turnover rate for entry-level positions jumped to 16% in July 2008 and raised to 20% in 2009. CAD technician and design specialists had a turnover rate of more than 20% while equipment operators had a turnover rate of 46% in 2009. Based on the market study, ODOT implemented pay increases, which are expected to lower the turnover rate. Fifty-one ODOT employees had at least a \$10,000 adjustment while almost six hundred ODOT employees had at least a \$5,000 adjustment. Overall, 87% of the approximately 2,400 ODOT employees in 2009 received a pay raise (30).

As the current workforce continues to age, with studies showing that up to 50% of all public agency workers can retire in the next 10 years (31). DOTs need to recruit younger students to fill future vacancies. However, not enough people are entering engineering or technical degree fields, which produce graduates that DOTs hire. To increase enrollment in engineering programs, young students need exposure to engineering before high school. Further, grants and fellowships aimed at underrepresented minorities and women encourage these groups to enter the engineering field (18).

Another recruiting issue is that graduating college students do not possess enough entry-level skills to succeed. In a study by Wittwer et. al. (31), a survey was sent to state authorities and universities to get their insight on transportation needs and workforce issues. State authorities felt that there are skills a state transportation employee needs that are not addressed at the university level. For instance, accountability and transparency requirements require employees to be able to analyze performance and communicate information to external stakeholders clearly, which emphasizes the importance of public communications skills. Undergraduate programs commonly include developing communications skills as a learning objective, but students often lack confidence in these skills when entering the workforce. Other skills not emphasized at the university level include project and program management, conflict resolution, and ethics (31). While universities can implement some modifications to their programs, such as special certifications and dual

degrees, the state transportation agencies must also assist in addressing the skill gaps. Professional development, expanding distance learning and university networking, and partnering between universities, public agencies, and the private sector can improve skills in future employees.

1.1.2. Training and Development

Transportation agencies are recognizing that training is essential for recruiting and retaining employees (11). Training is one method of development that enhances the knowledge, skills, and competencies of individuals to perform specific tasks while orienting and encouraging employees to grow professionally within the organization (9). In addition to conventional technical training, employees request training in soft skills including interpersonal skills, teamwork, performance and time management, and leadership skills (32).

The availability of training programs can influence recruiting and retention of employees. If recruits are unable to access initial training, then they may feel like they are being “thrown to the wolves” and have to learn on the go. Then, restricting or limiting training for managers can make them feel undervalued, and this sense can be passed on to their employees. This feeling of limited or no value to the DOT, in turn, lowers morale and job satisfaction levels, which leads to a loss of loyalty and retention issues (33). Unfortunately, during budget cuts, training is often among the first areas eliminated.

Although one of the challenges transportation agencies face in training and development is lack of funding, researchers and practitioners have provided recommendations to obtain low or no cost training and development guidance (2, 8, 22). Some successful techniques recommended providing a continuous learning environment for DOT employees that require limited funding including:

- Web-based training, which can be developed in-house or use a third-party vendor;
- Tuition reimbursement programs,
- Scholarships tied to employee performance,
- Succession planning,
- Job rotations,
- On-the-job coaching,
- Mentoring programs, and
- Training sessions hosted by the DOT (2, 8).

Implementing succession plans, job rotations, and on-the-job training enables transportation agencies to develop and promote high potential employees and managers to fill vacant positions (8). However, succession planning, job rotations, and on-the-job training are not only about finding replacements but also about developing talent, building additional strengths in employees, and preserving the organization’s institutional legacy (24).

Considering that workforce development is necessary to address the issues of leadership and succession management, many state DOTs have initiated programs focused on developing transportation leaders to meet both present and future needs (22). These professional development programs embrace internal development and promoting opportunities as it reduces recruitment costs, ensures that the workforce receives training and development, and possibly increases retention (8). As a result, employees develop a sense of loyalty to the agency (11).

1.1.3. Retention

In 2002, researchers in collaboration with the Transit Cooperative Research Program (TCRP) surveyed 50 HR managers from 33 different transit agencies to determine the positions most difficult to retain employees (11). The data obtained indicated that certain positions were notorious for high turnover: IT professionals or systems analysts (91%), engineers (88%), bus operators (80%), planners (67%), and mechanics (62%). Respondents cited that labor-market conditions, low unemployment rate, and non-competitive salaries and benefits were the primary factors affecting recruiting and retaining employees in the above job positions. Retention becomes an ongoing problem as employees frequently leave for more lucrative jobs offered at other agencies or in the private sector. However, employee loyalty is not only achieved with high salaries and monetary rewards (33). The policies of performance, recognition, development and career opportunities and flexible work environment are essential when agencies need to retain talented professionals (34).

Retaining quality employees is a primary concern for DOTs as the costs associated with recruiting, selecting, and training new employees can exceed 100% of the annual compensation for the vacated position. The loss of employees can also lead to work disruptions, loss of experience and knowledge, and loss of productivity (35). There are several approaches to effectively manage employee turnover besides using compensation and benefits-based solutions such as employee orientation, safety incentives, and upward communication and feedback (11). Table 4 lists common retention strategies found in the literature review.

Table 4. Common retention strategies used by state DOTs.

Retention Strategies	
• Annual bonuses	• Tuition reimbursement
• Project bonuses	• Mentoring program
• Safety bonuses	• Professional development
• Salary increases / raises	• Relocation assistance
• Promotions	• Leave / time off flexibility
• Recognition of exceptional work	• Reimbursement of professional dues
• Work schedule flexibility / telecommuting	

The HR methods used to select and hire managers and supervisors can influence retention levels since unqualified supervisors can impact morale and working conditions (8). Further, it is important to determine what agency employees want, rather than just matching what is being offered by other entities. Offering what DOT employees want can result in employee buy-in on the agency culture and mission, which assists with retention. This buy-in begins during the interview process and continues throughout employment. Using ad-hoc committees, performance improvement teams, and employee goal setting involves employees in the organization of the agency and contributes to a culture of DOT ownership and loyalty (8).

With an effort at improving recruitment and retention initiatives within state DOTs, a wide variety of practices are recommended to attract and maintain potential employees. Transportation agencies can offer many attractive attributes to current and future employees such as job security and stability, opportunities for professional development, flexible schedules, and work-life balance. Therefore, this research study intends to:

- Investigate the current trends in workforce shortages and changes,

- Explore the ideals and expectations of different workforce generations,
- Review agency loyalty along with current hiring and retention practices, and
- Develop strategic guidance based on how to hire new and younger generations of employees as well as minority and underrepresented individuals that want to work and continue to work at a transportation agency for many years.

This research project provides solutions for workforce development strategies while acknowledging the limitations placed on state DOTs, such as limited budgets and the inability to offer comparable salaries than private entities. This project also includes the implementation of various workforce development, outreach, and education programs to disseminate the results and put the findings into action. To achieve this guidance and solutions, this research team adhered to the following objectives, scope, and methodology.

2. OBJECTIVE

To ensure that this research satisfies the need for transportation agency recruitment and retention guidance, the following are the research objectives:

- Determine the best practices employed by transportation agencies, other public agencies and organizations, and private firms that lead to recruitment of qualified transportation agency employees,
- Assess current best practices that are used to retain qualified and experienced transportation agency employees,
- Identify potential institutional barriers that exist within transportation agencies that limit the recruitment and retention of high-quality employees, and
- Develop outreach, educational, and workforce development hands-on activities to expose and engage bright young minds from underrepresented groups to broader fields of transportation and the associated careers.

3. SCOPE

The research examined current and future transportation workforce issues at state DOTs located in Region 6 (AR, LA, NM, OK, and TX; see Figure 1) by evaluating employee recruiting and retention strategies and identifying the practices that can have the potential for success and implementation at state DOTs in general. The scope included:

- Conducting a literature review of relevant reports, documents, and journal articles related to transportation workforce and careers,
- Reviewing Region 6 DOT documents and information related to hiring and retention practices by DOTs,
- Interviewing Region 6 HR personnel to discuss current practices for recruiting and retaining quality employees,
- Distributing a survey questionnaire to current DOT employees working for one of the five Region 6 DOTs, and
- Determining best practices from the data collected for Region 6 DOTs to use in efforts to improve their hiring and retention practices for finding and keeping highly valued and quality employees.



Figure 1. Region 6 departments of transportation.

4. METHODOLOGY

The research methodology described below outlines the tasks and activities completed by the research team. The tasks described below include two phases. Phase I consisted of six tasks designated as the technical or research phase of the project. Phase II consists of three tasks to address the implementation or technology transfer/outreach phase of this project. Each task describes the scope of work the research team followed to achieve the project's objectives. The outcome of following this methodology is a set of recommendations and guidance for different recruitment and retention strategies that form a rigorous analysis of the current state-of-practice, determined from an extensive literature review, interviews with DOT HR personnel, and a survey questionnaire distributed to current DOT employees. This state-of-practice serves as the baseline for this research to make contributions to the areas of employee recruitment and retention at transportation agencies.

4.1. Phase I: Technical Phase

4.1.1. Task 1-1: Conduct Literature Review

The literature review included collecting and reviewing pertinent journal articles, reports, DOT documents, and previous research that reflect the practices used in transportation agencies relevant to recruiting, retaining, and promoting employees. The focus of the recruitment and retention literature collected and reviewed was the transportation and construction industries as well as other relevant industries, information related to human resources and human resources management, and literature connected to developing and conducting formal interviews and distributing a survey questionnaire. From the literature review, an annotated bibliography was developed, consisting of 32 journal articles, reports, and documents related to recruiting and retaining employees in transportation, construction, and engineering. The annotated bibliography helped the researchers develop the qualitative content analysis structure and data collection tools created in Task 1-2 (HR interview questionnaire) and 1-3 (current DOT employees survey).

4.1.2. Task 1-2: Review the Current State of Practice

Before developing the qualitative content analysis, the research team coded the information found in the literature review into manageable content categories. The coding structure used an organization based on three areas: (1) recruitment; (2) training and development; and (3) retention. The predefined set of categories in the coding scheme allowed one to focus on and code for specific themes and patterns. Appendix A contains the coding structure.

A qualitative content analysis is a research approach used to interpret the content of text data, using a systematic and defined classification process for identifying themes or patterns based on inferences and interpretations (36). For this research, the research team used an interpretive content analysis method. An interpretive study is a content analysis method of theoretical sampling that uses analytic categories and continuous and comparative analyses as the process derives categories for coding based on established theory and previous findings (37).

The content analysis was completed using NVivo, a qualitative content analysis software program, to analyze and find insights into the collected literature and documents. Researchers created nodes and child nodes and organized the nodes in hierarchies according to the coding structure. For example, the parent node "recruiting" contains the child node "compensation" which includes a more specific topic such as benefits. A text search query was then conducted to find and analyze the number of occurrences that each word, phrase, or concept appears in the source material.

Using the content analysis data, as well as the information from the literature review of previous similar studies, the research team created a semi-structured interview questionnaire for HR staff. The HR interview questionnaire consists of 20 questions which sought to inquire about the existence of recruitment and retention strategies and the effectiveness of their implementation. The questionnaire includes four main sections: (1) general information about the interviewee, (2) recruiting strategies and incentives, (3) retention strategies and incentives, and (4) promotion programs and incentives. Appendix B contains the interview questionnaire. The research team pilot tested the questionnaire with an ArDOT HR employee. From the pilot interview, the research team then made slight modifications and improvements to the interview questionnaire to streamline the questions and make the interview as concise as possible. With only slight changes made to the interview questionnaire, the initial interview with the HR personnel officer is included in the interview findings.

Selection criteria qualifications and objectives were determined, and the participants of the research were selected. In determining the best candidates for the case study, the participants were selected based on the following criteria:

- Current professional position in HR department,
- At least 10 years of professional experience in employee recruitment, training, compensation, and retention at a state DOT,
- Holds a managerial/leadership position, and
- Works for a state DOT located within Region 6.

Subsequently, the research team at LSU conducted in-depth interviews with DOT HR staff in October and November 2017. All the HR professionals participated in a 30- to 45-minute interview (conducted using a conference call except for participants located in the state Louisiana, whose interviews were conducted in person) to discuss the issues and practices in the areas of recruitment and retention of professional personnel. The interviewees played a vital role in the data collection process by bringing their knowledge and expertise to the research. Table 5 exhibits the positions and represented agencies of the HR personnel who participated in the interviews.

Table 5. HR interview participants.

No.	Position Title	DOT Agency
1	HR Personnel Officer	Arkansas DOT
2	Talent Acquisition Coordinator	Arkansas DOT
3	HR Director	Louisiana DOTD
4	HR Director	New Mexico DOT
5	HR Manager	New Mexico DOT
6	Talent Manager	Oklahoma DOT
7	Talent Acquisition Coordinator	Texas DOT
8	Recruitment Specialist	Texas DOT
9	Recruitment Specialist	Texas DOT

During each interview, the researcher collected notes and other HR materials from the interviewee. After completing the interviews, the research team evaluated the interview data using a similar content analysis procedure used for the collected literature. The interpretive content analysis revealed common themes and trends between the five DOTs as well as note any differences or innovative approaches in use for recruiting and retaining high quality and highly valued employees. From the coding scheme, research results were analyzed from a thematic perspective to propose useful findings and identify knowledge gaps for future research studies. Appendix C provides a summary of the interview findings.

4.1.3. Task 1-3: Identify Institutional Barriers

Using the findings from the HR interviews and the annotated bibliography, the research team developed a survey questionnaire for current DOT employees to assess employee characteristics, perspectives, attitudes, and beliefs on recruitment and retention efforts at state DOTs found in Region 6. The survey questionnaire consisted of 41 questions and was organized into three main sections: (1) general overview, (2) hiring, retaining, and promoting, and (3) perception of your DOT. Appendix D contains the survey questionnaire.

Using the HR contacts at each of the five Region 6 DOTs, the research team distributed the survey questionnaire to the HR personnel electronically for review and further distribution to the department. The HR contacts at Arkansas and Oklahoma reviewed and accepted the survey questionnaire, which was then distributed via email using Qualtrics to the entire department. Arkansas distributed the survey in January 2018 and Oklahoma in February 2018. Each survey was then open for four weeks to collect as many responses as possible. ArDOT and ODOT had the highest amount of responses collected.

For New Mexico, the State is currently consolidating the HR division for all state agencies into one central agency. Due to this ongoing consolidation, the research team struggled to gain access to HR personnel that is explicitly related to NMDOT and not just a State HR employee. Also, gaining acceptance to distribute a survey agency-wide was difficult due to the changes to the HR throughout the state. Although the research team eventually spoke with two NMDOT HR staff, the HR personnel were unable to find a list of current employees to distribute the survey to. So, the research team acquired current employee information from the NMDOT agency website and other online transportation sources such as AASHTO and ITE, while handing out flyers and brochures at a Paving and Transportation Conference in New Mexico for current DOT employees to complete the survey. Therefore, the sample size of collected survey responses from NMDOT is very low compared to ArDOT and ODOT.

TxDOT showed a strong interest in participating in distributing the survey to its employees. However, the research team had a difficult time communicating with the TxDOT HR personnel after Hurricane Harvey hit the Texas coastline in late summer 2017. The research team conducted the HR interviews with TxDOT in late September 2017 and had limited contact after this time. The research team attempted to gain acceptance of the survey and distribute it through the TxDOT HR personnel on several occasions but did not receive any feedback or response. Therefore, from an online state employee directory, the survey was distributed independently to obtain responses from a small set of current TxDOT employees.

Finally, despite participating in the interview process and providing information and documents pertinent to recruiting and retaining employees, LaDOTD declined to distribute the survey to their

employees. The research team used the other four Region 6 DOTs for the survey questionnaire data collection and analysis.

The research team encouraged as many responses as possible, regardless of the DOT. Table 6 shows the total sample size by state and overall. With the disparity in sample sizes across the four Region 6 DOTs, weighted values and averages are used in the analysis to normalize the results based on the respondents.

Table 6. Survey responses by Region 6 state DOT.

State DOT	Sample Size (n)
Arkansas	481
New Mexico	30
Oklahoma	544
Texas	54
TOTAL	1,109

4.1.4. Task 1-4: Identify the Need

Using the data collected from the survey, the findings from the HR staff interviews, the content analysis results on the current state-of-practice, and the annotated bibliography from the literature review, the research team analyzed the data to determine common practices for quantifying the need for DOTs to effectively and consistently recruit employees. The primary data collection is the HR interviews and the current DOT employees survey questionnaire. The findings from the HR interviews were summarized (Appendix C) based on the common themes and trends to determine the current state of practice for recruiting and retaining DOT employees, which then provides commonalities for identifying the needs for DOT HR departments and developing recommended recruiting and retention strategies.

For the survey questionnaire, the large data set contained 1,109 responses from a variety of current DOT employees. The research team then analyzed the responses that pertain to the demographics of the current DOT employees that responded to the survey, the hiring process that the respondents went through, and retention-based questions using frequencies and descriptive statistics to classify the responses to the survey questions. The analysis looked at the data set in total as well as across each of the four Region 6 DOTs. Additionally, the survey questionnaire contained perception statement items, rated on a five-point Likert scale, ranging from strongly disagree (1) to strongly agree (5). The research team evaluated the perception statement item responses using frequency rates and a statistical tool called the Relative Importance Index. The survey data analysis helped to establish concurrency with the DOT HR interviews as well as confirm findings from the literature. The survey results are the foundation for the recommendation strategies presented in this report.

4.1.5. Task 1-5: Make Recommendations

From the data collected and analyzed, the research team developed recruitment and retention recommendation strategies that DOTs can utilize to hire quality personnel and retain them long term. The recommendations revolve around suggestions to overcome potential barriers to recruiting, such as lower salary compensation than the private sector, and to retention, such as

offering incentives and professional development to ensure employees stay. Then, the research team describes the practice strategy that can enhance the DOT HR efforts to find qualified and highly valued employees for high turnover positions within the DOT. The recommendations contain possible motivators that can entice more people to consider employment with state transportation agencies and to stay there for an extended duration. Finally, the recommendations developed should translate to any state DOT, regardless if it is a Region 6 DOT or not.

4.1.6. Task 1-6: Develop and Submit Final Deliverables

The final task in the technical phase is to assemble the findings and conclusions this final report that state DOTs can use. The research report documents in detail the process used to conduct the research project. Also, the final report includes recommendation strategies for DOTs to use with attracting, hiring and keeping valuable human resources. Review of the final report and the findings and conclusions include vetting with individuals from DOTs within Region 6 based on their involvement in HR management for the DOT. The results are to be disseminated at conferences and in peer-reviewed journals as well as culminating into education and outreach tools that the research team will use to conduct workforce development, outreach, and educational activities at state DOTs found in Region 6 so that the research is adequately implemented, used, and applied. The implementation activities are described below in Phase II.

4.2. Phase II: Implementation Phase

4.2.1. Task 2-1: Workforce Development

With the research complete, the research team moves into the implementation phase by disseminating the research results through conferences, workshops, webinars, and seminars. The research team developed a presentation for a possible webinar and seminar with the Region 6 LTAPs. The webinar summarizes the research project as well as detail the findings and recommendation strategies. The webinar is geared towards state DOT HR personnel and can be offered as a live and recorded webinar as a part of the Tran-SET Webinar series. Additionally, the recorded version of the webinar will be freely available on the Tran-SET website. There is a possibility that the webinar can also be formulated as training materials for a workforce seminar and offer it through the LTAPs found in Region 6.

4.2.2. Task 2-2: Outreach Activities

Dissemination of the research results targets the audience of decision makers within DOTs who have the responsibility to recruit, hire, and retain employees. The research team presented the results of the project to the World Transport Conference in Beijing, China in June 2018 and at the AASHTO Committee on Construction Annual Meeting in August 2018. Further, the research team developed an extended abstract for the 98th TRB Annual Meeting that takes place in January 2019 and a paper for an ASCE peer-reviewed journal. The research team plans to develop and submit the ASCE peer-reviewed journal article in early 2019.

4.2.3. Task 2-3: Education Programs

To encourage younger individuals about transportation careers, Prairie View A&M University (PVAMU) team organized a total of two educational outreach activities to promote the work performed by state DOTs, and the University of New Mexico participated in the Summer Transportation Institute (STI). The first activity planned by PVAMU targeted K-5 students while the other activity focused on incoming engineering college freshman. UNM activities for the STI focus on high school students. The primary goal of these outreach activities was to create interest

in the broader field of transportation by engaging them with hands-on activities that are suitable for their age group.

The research team at PVAMU and UNM have been involved with and hosted STI programs for high school students for many years. Building on that experience the team built activity modules that are not only educational but also generate curiosity and interest for the broader field of transportation and the different careers that this field supports. The research team considered using AASHTO's Transportation and Civil Engineering (TRAC) and Roadways in Developing Elementary Students (RIDES) educational outreach programs, which provides resources to perform hands-on activities related to bridge design, city planning, design and construction, environmental engineering, highway safety, magnetic levitation, motion, and traffic technology.

The K-5 student's outreach activities conducted by PVAMU for summer of 2018 included a hands-on transportation workshop for K-5 students offered at a local community college, Lone Star College at Cy-Fair (LSC), located about 25 miles away from PVAMU, which covers the northwest part of Houston, TX. The location was chosen to impact a large population of the area, which is home to Cy-Fair Independent School District (CFISD), one of the largest school districts in the country with a student population more than 100,000. The target population was elementary school level (K-5) students. LSC collaborated with PVAMU for these K-5 activities. The activities planned covered half a day, and they included a brief and engaging presentation followed by several hands-on activities.

The freshman education outreach activity targeted incoming freshman interested in engineering programs at PVAMU. PVAMU has been offering the Roy G. Perry College of Engineering Enhancement Institute (CE²I) for many years now. The objective of this program is to introduce incoming freshman to the concepts of Science of Technology, Engineering and Mathematics (STEM) and how these concepts are used in our daily life and motivate them to be successful engineering students and eventually engineers. The program is a five-week summer bridge to college program intended to prepare students for the rigor of a pursuing a STEM major. The team developed three modules that focus on transportation-related hands-on activities. These activities improve the student's understanding of the role of transportation in everyday life and promote transportation field as a potential career. The CE²I program took place in late June/July 2018.

UNM engaged high school level students by participating in the UNM STI program during the summer of 2018. The STI, which UNM participated in during the summer of 2017, has a goal of encouraging high school students to pursue careers in the transportation industry. The Structural Engineering and Materials Lab at the Department of Civil Engineering has developed a workshop to teach the STI students how to test the behavior of metals (steel and aluminum) and timber; how to evaluate concrete aggregates, Portland cement, and Portland cement concrete; and how to test asphalt binders and hot mix asphalt for pavement.

5. FINDINGS

The data collected includes literature, interviews, and a survey questionnaire. From the data collected and analyzed, this section presents the findings on recruiting and retention practices at state DOTs. The details discussed outline the framework for the current recruiting and retention practices at state DOTs as well as the current state of the DOT employee workforce. The results show that DOTs do struggle with competing in salary compensation, but do have several advantages that outweigh working for another agency or private firm. Most employees, the data shows, are proud to be a state employee and make a valued contribution to the agency, yet working conditions could change, and morale can increase. The findings lead to the recommendations and strategies presented in the next chapter.

5.1. Region 6 State DOT Employees

The research team developed and distributed a survey to the Region 6 DOTs that agreed to distribute the survey to comprehend the current status of DOT employees and how they perceive their DOT agency regarding recruitment and retention. The objective of the questions in the survey was to gather demographic information from current state professionals. Therefore, each employee was asked to identify working characteristics, including: 1) job classification; 2) level of education; 3) years working for the DOT; 4) years working in their current position; 5) gender and age; and 6) years until retirement.

Using the demographic data obtained, the research team established the individual characteristics and compared the findings across the states. A total of 1,109 complete responses represent the data set for the survey questionnaire. As the survey was designed to be completed by any DOT employee and for random sampling purposes, the responses came from a variety of employees from different backgrounds and different perceptions of the DOT, which produces a rich set of findings. To show the diversity in the responses to the survey, Figure 2 shows the total count of responses broken down by the current position that each respondent holds at their respective state DOT employer. Each state DOT surveyed has been shaded a different color to designate which positions the respondents are related to at each state DOT.

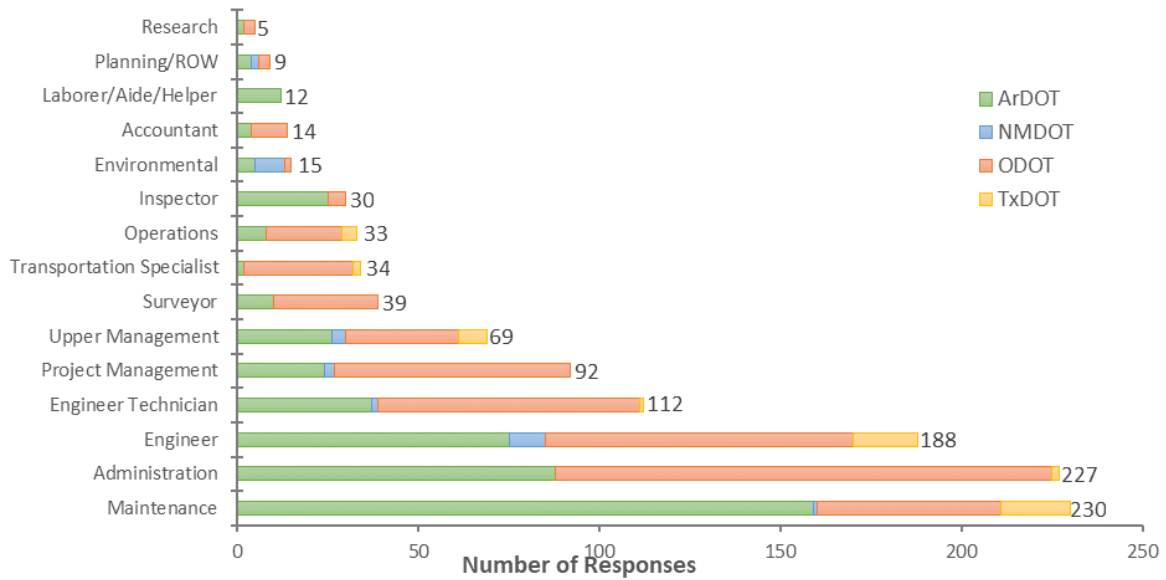


Figure 2. Breakdown of current DOT employees by position.

Due to the random sampling method used by distributing the survey to a list of current DOT employees at the four state DOTs that participated, the number of respondents for each position varies from one DOT to the next, as shown in Table 7. For example, Engineers represent 15.6% of the responses from Arkansas and Oklahoma DOTs, while engineers at New Mexico and Texas DOTs represent 33% of the responses. Then, for maintenance personnel, the Arkansas and Texas DOT responses are 33% and 25% respectively, while 9% of Oklahoma DOTs responses are from maintenance personnel, and only 3% from New Mexico DOT. The variety of positions provides for a diverse set of responses from across the entire DOT.

Table 7. Job classification of the survey responding DOT employees (count shown in parentheses).

Profession	ArDOT	NMDOT	ODOT	TxDOT
Maintenance	33.1% (159)	3.3% (1)	9.4% (51)	35.2% (19)
Administration	18.3% (88)	--	25.2% (137)	3.7% (2)
Engineer	15.6% (75)	33.3% (10)	15.6% (85)	33.3% (18)
Engineer Technician	7.7% (37)	6.7% (2)	13.2% (72)	1.9% (1)
Project Management	5.0% (24)	10.0% (3)	12.0% (65)	--
Upper Management	5.4% (26)	13.3% (4)	5.7% (31)	14.8% (8)
Surveyor	2.1% (10)	--	5.3% (29)	--
Transportation Specialist	0.4% (2)	--	5.5% (30)	3.7% (2)
Operations	1.7% (8)	--	3.9% (21)	7.4% (4)
Inspector	5.2% (25)	--	0.9% (5)	--
Environmental	1.0% (5)	26.7% (8)	0.4% (2)	--
Accountant	0.8% (4)	--	1.8% (10)	--
Laborer/Aide/Helper	2.5% (12)	--	--	--
Planning/ROW	0.8% (4)	6.7% (2)	0.6% (3)	--
Research	0.4% (2)	--	0.6% (3)	--

Education levels also differ by state, as shown in Figure 3. At ArDOT, ODOT, and TxDOT, more than 35% of the current DOT employees that responded to the survey have an undergraduate degree, while 53% of current DOT employees responding to the survey at NMDOT have a graduate degree, either a Master or Ph.D. level degree. The difference between NMDOT and the other three DOTs can be a result of the small sample size from NMDOT and that most of the sample that completed the survey are from management positions, which sometimes require more education. Overall, at least 75% of the surveyed DOT employees in the four states have some college or a college degree, which indicates how educated state DOT employees are, which from these results show that a college degree is becoming more of a requirement for employees than in the past.

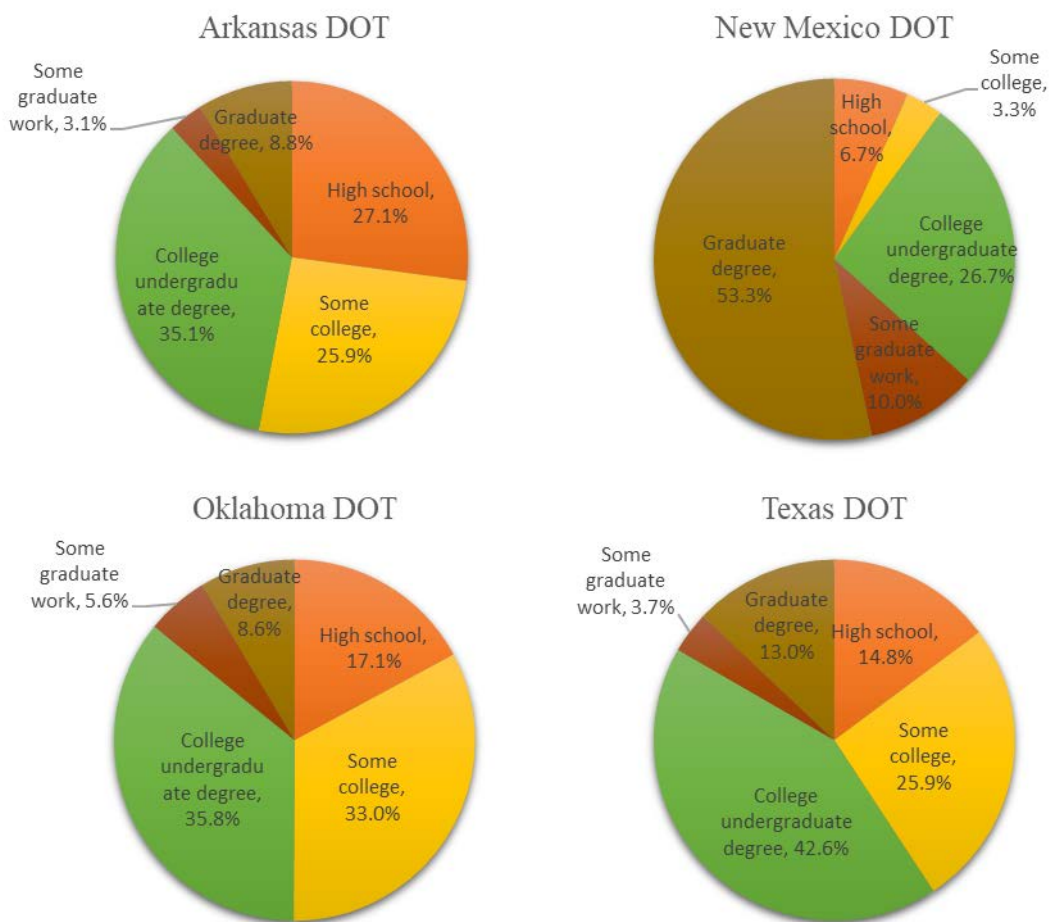


Figure 3. Level of education for the current DOT employee survey participants.

Then, regarding gender for the survey respondents, as shown in Figure 4, most professionals (68%) in the workforce are male. Arkansas, New Mexico, and Oklahoma each have about 1/3 of respondents as current female employees, which is equivalent to the overall average. The survey respondents from TxDOT have a proportion of female survey respondents that is lower, at only 11%.

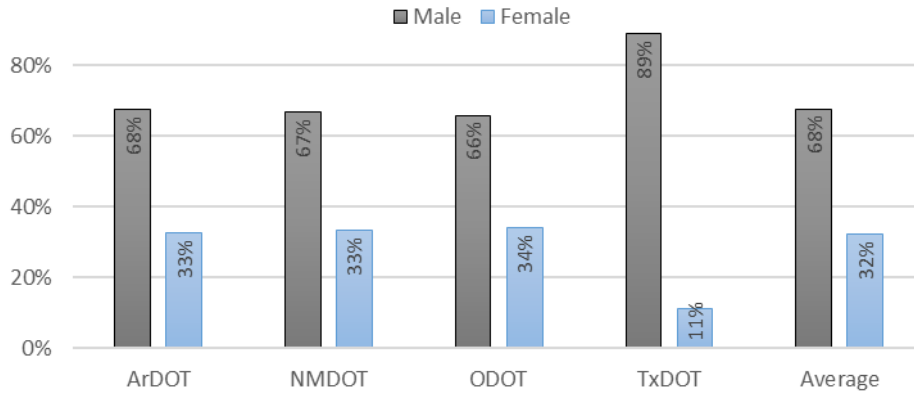


Figure 4. Gender breakdown of current DOT employees' survey responses.

There is also a difference among the states in terms of age of professionals. The workforce for the four states, shown in Figure 5, displays that the current DOT employees at TxDOT have the fewest workers age 39 and under with 23%, followed by Oklahoma with 33%, New Mexico with 37%, and Arkansas at 39%. Oklahoma has the largest amount of current workers age 50 and over (44%), followed by Texas (42%), Arkansas (40%), and New Mexico (33%).

The average totals show that about 39% of the survey respondents are 50+ years old in the state DOTs from Region 6, while the majority of survey respondents are 40+ years old at 64%. The loss of highly skilled and well-experienced individuals can result in competency gaps to appropriately perform specific critical tasks as employees 40 and older begin to retire over the next 10 to 15 years.

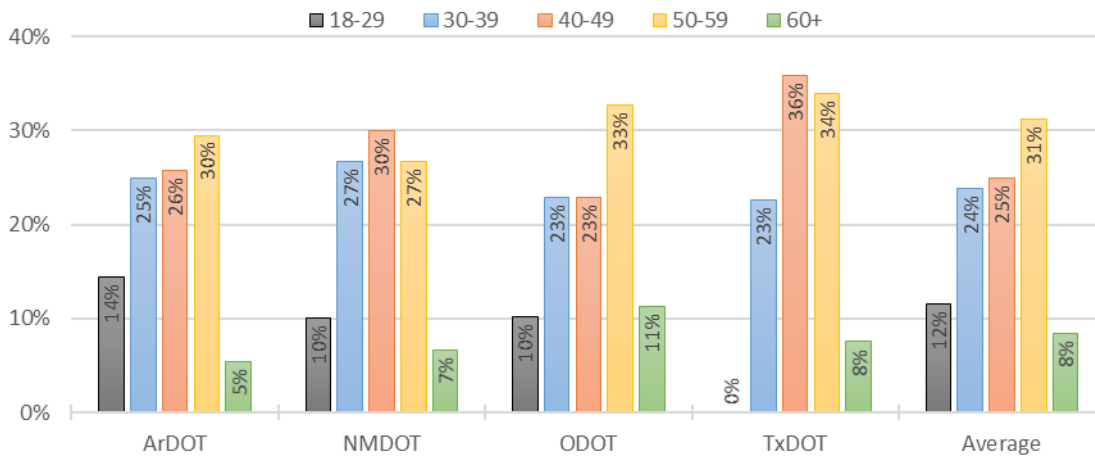


Figure 5. Age distribution of current DOT employees from survey responses.

As shown in Table 8, the age characteristics also reflect the responses obtained to the question of how many years from now the employee is eligible to retire from the DOT agency. An average of the overall trend in all four states shows that 33.7% of state employees are already eligible or could retire within the next five years and the rate jumps to 47.1% for current DOT employees that can retire in the next 10 years.

Table 8. Years until eligible to retire.

Years	Arkansas	New Mexico	Oklahoma	Texas	Average
0 years (already eligible)	14.1%	3.3%	19.3%	27.8%	16.1%
1-5 years	13.9%	23.3%	10.9%	22.2%	17.6%
6-10 years	13.3%	6.7%	7.5%	25.9%	13.4%
11-15 years	16.4%	20.0%	12.0%	14.8%	15.8%
16-20 years	12.7%	16.7%	15.6%	3.7%	12.2%
20+ years	29.5%	30.0%	34.7%	5.6%	25.0%

5.2. Recruitment

The following information in this section presents the status of recruiting strategies used within the five state DOTs along with a summary of the internal and external factors affecting the recruitment of employees. The section also includes data from current state employees' views and perspectives on recruitment and retention efforts.

5.2.1. Hiring

Based on the literature review and using the annotated bibliography created, the research team created a list of recruiting factors for survey respondents to select their top three reasons that attracted them to seek employment with their DOT agency when hired initially, which include:

- Appealing job position,
- Competitive salary,
- Health benefits,
- Retirement benefits,
- Vacation/leave benefits,
- Promotion opportunities,
- Education benefits/tuition reimbursement,
- Professional development opportunities,
- Challenging work assignments,
- Many responsibilities,
- Stable employment,
- Diverse workforce,
- The desire to perform public service,
- Working as a state/government employee, and
- Relative or friend was already a DOT employee.

Although for many survey respondents it meant recalling the recruitment process that may have occurred years ago, responses about why employees decided to join the state DOT can help in developing compelling strategies for recruiting new employees. Of the possible responses, Table 9 lists the top five responses from each state along with the response rate. With four different DOTs receiving the same survey questionnaire and the different sample sizes of responses from each state, the results are very similar from state to state. The top factors include retirement benefits, stable employment, health benefits, appealing job position, vacation/leave benefits, public employment, and professional development opportunities. This finding shows that DOTs, although different in many ways, have employees that realize the benefits of working for a DOT regarding health, retirement, and stable employment. It is also interesting to point out that

“competitive salary” is not shown as a top reason to work for a DOT. This is more proof that DOTs cannot offer the same salary as private firms or other agencies and must rely on alternative methods to attract, hire, and keep quality employees.

Table 9. Top five factors employees were attracted to work for the DOT.

No.	ArDOT	NMDOT	ODOT	TxDOT
1	Retirement benefits 24.1%	Retirement benefits 18.9%	Stable Employment 20.5%	Retirement benefits 19.1%
2	Stable employment 20.6%	Stable employment 16.7%	Health benefits 19.9%	Stable employment 17.3%
3	Health benefits 13.0%	Appealing job position 11.1%	Retirement benefits 15.7%	Health benefits 16.1%
4	Vacation/leave benefits 11.0%	Health benefits 10.0%	Vacation/leave benefits .2% ¹²	Vacation/leave benefits 10.5%
5	Public employee 7.0%	Professional development 8.9%	Appealing job position 6.7%	Public employee 8.6%

A survey question asked about how current employees found out about employment with their DOT. Table 10 shows the responses received, and overwhelmingly the survey respondents found out about DOT employment from someone they know that already works at the DOT, as the average response was 50%, with ArDOT the highest at 56.3% and NMDOT the lowest at 33.3%. The second highest response was that current DOT employees find out about employment through websites and social media, with an average of 20% of the responses stating such. The third most common response was through a college or university, which represents on average about 11% of the total respondents. College and university recruiting occur regularly at many engineering and technical schools across the United States to bring in young and knowledgeable recruits.

Table 10. How current DOT employees found out about employment with the DOT.

Factors	ArDOT	NMDOT	ODOT	TxDOT	Average
Relative/friend/colleague	56.3%	33.3%	46.5%	42.7%	50.2%
Website/social media	16.7%	26.7%	26.3%	16.7%	21.7%
College/university	11.0%	10.0%	7.4%	14.8%	9.4%
Do not remember	5.8%	0.0%	4.6%	5.6%	5.1%
Walk in	3.3%	6.7%	3.3%	5.6%	3.5%
Job fair	2.5%	0.0%	2.0%	5.6%	2.3%
Newspaper/magazine	1.5%	6.7%	3.5%	5.6%	2.8%
Recruiter	1.5%	13.3%	4.4%	1.9%	3.2%
Worked for another state agency	0.8%	0.0%	1.3%	1.9%	1.1%
Through professional network	0.4%	3.3%	0.0%	0.0%	0.3%
Worked with DOT for a private firm	0.2%	0.0%	0.7%	0.0%	0.4%

5.2.2. Difficult to Fill Positions

While state DOTs mainly employ civil engineers, other disciplines and technical specialties are also employed in critical positions within a DOT. DOTs tend to struggle to recruit a wide range of the technical workforce needs. According to the research findings, Region 6 state DOTs noted the difficulty in recruiting staff for the positions listed in Table 11.

Table 11. Job vacancies that DOTs struggle to fill.

State DOT	Engineers	IT Professionals	Equipment Operators	Maintenance	Mechanics	Surveyors	Inspectors
Arkansas	✓	✓		✓			
Louisiana	✓		✓				
New Mexico	✓			✓		✓	
Oklahoma	✓		✓		✓	✓	
Texas	✓						✓

5.2.3. Recruitment Strategies

The five DOTs studied revealed similarities and differences in how transportation agencies respond to challenges in recruiting a qualified workforce, especially in technical positions. Advertising jobs solely through transportation-specific publications and websites allow for a narrower applicant pool consisting of individuals interested in transportation and with some transportation-related skills and experience. Social networks can help to spread job offers efficiently, yet LaDOTD does not acknowledge the need to explore further online sites such as LinkedIn, Facebook, and Twitter. The majority of the state DOTs participate in job and career fairs at universities and colleges as a means to attract potential applicants, including women and minorities.

Only the state DOTs of Arkansas, Oklahoma, and Texas use newspaper and magazine ads to fill vacant positions. Table 12 summarizes the primary practices that Region 6 state DOTs engage in for recruiting needed employees, as obtained from discussions with DOT HR personnel.

Table 12. State DOT recruitment strategies used.

State DOT	Websites	Job Fairs	Social Media	Newspapers & Magazines	Universities & Colleges	Other
Arkansas	✓	✓	✓	✓	✓	
Louisiana	✓				✓	
New Mexico	✓	✓	✓		✓	✓*
Oklahoma	✓	✓	✓	✓	✓	✓*
Texas	✓	✓	✓	✓	✓	

*New Mexico uses “Now Hiring” Banners across the state to actively promote job vacancies while Oklahoma uses the strategic approach of headhunting.

5.2.4. Training and Career Development

Table 13 shows a comparison of the training programs and strategies that Region 6 DOTs implement and use for their employees. All states require some time for introductory training at the time of hire as well as incremental training as needed to succeed in their position with the DOT. Additionally, most of the state DOTs studied provide in-house training and certification training programs.

Table 13. State DOT training programs.

State DOT	Mandatory Training	In-house Training	Cross Training	Online Training	Certification Training
Arkansas	✓			✓	✓
Louisiana	✓	✓		✓	
New Mexico	✓	✓	✓		✓
Oklahoma	✓	✓		✓	✓
Texas	✓	✓	✓		✓

A common challenge voiced by each of the state DOTs studied is the fact that some employees use the agency’s resources to obtain the required certification or licensing and then leave for another job with another firm or agency. For example, entry-level maintenance personnel hired to operate heavy equipment are provided the training and resources to obtain a commercial driver’s license (CDL). However, once they obtain the CDL, employees leave the agency for another commercial operating firm such as a hauling company, that can offer a higher hourly pay than that of the DOT.

For the most part, the state DOTs implement career development programs to provide employees with opportunities for professional growth, as outlined in Table 14. Agencies are more likely to have a more knowledgeable and skilled workforce by providing employees with funding for continuing education or training (8). Offering education reimbursement can also attract potential applicants and retain current employees (4). Arkansas is the only agency that does not offer some form of tuition reimbursement. Thus, the agency utilizes alternative approaches such as in-house and cross training and provides certification training for engineering positions to obtain required licenses. Of the five states responding to the survey, LaDOTD, NMDOT, and TxDOT implement formal succession programs for employees through mentoring or job rotations.

Table 14. State DOT career improvement strategies.

State DOT	Career Development Programs	Performance-Based Evaluation	Education Reimbursement	Succession Planning
Arkansas	✓			
Louisiana	✓	✓	✓	✓
New Mexico	✓		✓	✓
Oklahoma	✓	✓	✓	
Texas	✓		✓	✓

5.3. Retention

Retention strategies used within each of the five state DOTs are affected by internal and external factors. Therefore, this section details the current practices of state DOTs regarding retention of quality employees as well as the factors limiting the efforts of DOTs to retain critical employees. The data provided is a result of the literature review, content analysis, and interview responses.

5.3.1. High Turnover Positions

From the interviews with DOT HR staff, the collected data shows a wide variety of turnover positions experienced by the states DOTs. The five state DOTs studied noted that the positions of engineers and maintenance are subject to high turnover, as shown in Table 15. For the most part, DOTs experience turnover in positions that offer much lower wages when compared to positions with private firms. For example, ODOT and TxDOT noted in the interviews that maintenance

equipment operators tend to leave the DOT when the oil and gas industry is booming because the oil and gas industry firms pay much higher salaries when compared to the DOT. Also, when the market is booming, as it is in 2018, private firms are willing to pay a premium salary to engineers as private firms are shorthanded as well, which DOT cannot compete against.

Table 15. High DOT turnover positions.

State DOT	Engineers	Engineering Technicians	IT Professionals	Maintenance	Surveyors	Inspectors
Arkansas	✓		✓	✓		
Louisiana	✓	✓				
New Mexico	✓			✓	✓	
Oklahoma	✓	✓		✓		
Texas	✓			✓		✓

5.3.2. Retention Strategies

Evidence shows that in many states the salaries paid in the public sector are significantly lower than those offered in the private sector (38). The overall benefits enjoyed by workers at the transportation agencies are typically greater than those offered in the private sector. However, the higher salaries offered by private sector firms offset the reduced benefits. Thus, research recommends transportation agencies offer competitive benefits packages along with career development opportunities and a healthy work-life balance to encourage employee retention (8). For instance, all the state DOTs offer competitive benefits that include sick and vacation leave, health-life insurance, and a retirement program with a match of funds by the state. In addition, state DOT employees from Arkansas, Louisiana, Oklahoma, and Texas can work flexible hours. The state DOTs of Louisiana, New Mexico, Oklahoma, and Texas provide education assistance programs for those pursuing advanced studies related to their position.

In discussions with DOT HR staff, Table 16 summarizes the current retention strategies used by Region 6 DOTs. The state DOTs of Arkansas, Louisiana, Oklahoma, and Texas recognize the accomplishments of high performing employees with a special bonus. For instance, ArDOT uses a performance-based pay system as an incentive to retain employees. Likewise, LaDOTD rewards employees for their excellence through monetary and service awards. Furthermore, ODOT and TxDOT rewards employees for longevity in the form of increased wages and bonuses.

Table 16. State DOT retention strategies stated by DOT HR staff.

State DOT	Competitive Benefits	Bonus	Schedule Flexibility	Recognition Programs	Education Assistance	Training & Development Opportunities	Workplace Diversity
Arkansas	✓	✓	✓	✓		✓	✓
Louisiana	✓	✓	✓	✓	✓	✓	✓
New Mexico	✓				✓	✓	✓
Oklahoma	✓	✓	✓	✓	✓	✓	✓
Texas	✓	✓	✓		✓	✓	✓

5.3.3. DOT Incentives

State DOTs can offer a variety of bonuses and incentives to employees that help DOTs to keep employees from leaving the DOT for another firm. The survey collected responses on whether a current DOT employee has received at least one incentive or bonus while working for the DOT. Figure 6 shows the results in that 51% of the ArDOT responses (243 individual responses) have received an incentive, 27% of the NMDOT responses (8 individual responses) have received an incentive, 23% of the ODOT responses (125 individual responses) have received at least one incentive, and 80% of the TxDOT responses (43 individual responses) have received at least one incentive from their current DOT employer. A total of 419 responses noted receiving at least one incentive while working for their DOT.

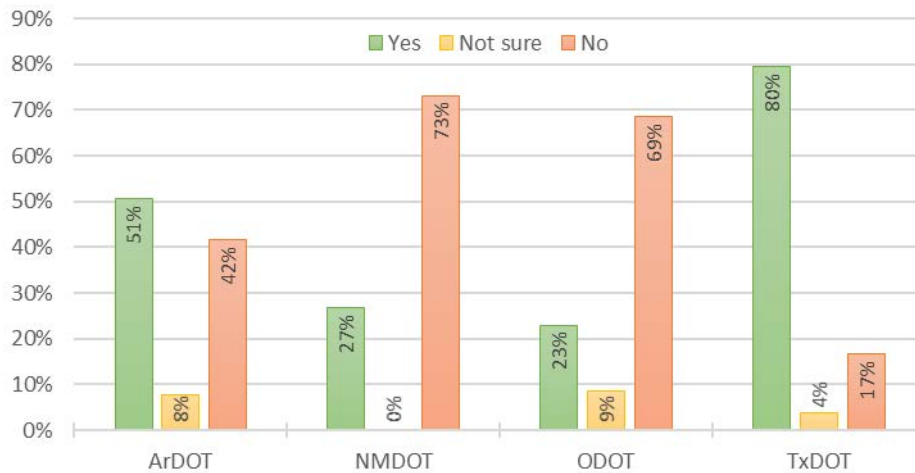


Figure 6. DOT current employee survey respondents receive incentives.

In reviewing Figure 6, ArDOT and TxDOT responses show that more than half of the survey responses have received at least one incentive from their DOT. NMDOT shows a much higher response of not receiving any incentive while working for NMDOT. This situation could be explained by the fact that the sample size for NMDOT is only 30 current employees, a small amount that may not reveal the results for the population of NMDOT employees. The more significant concern is the results from Oklahoma DOT. ODOT had the largest number of responses at 544, but only 125 ODOT employees note receiving at least one incentive while working at ODOT, revealing that ODOT may not have the same incentive abilities as other Region 6 DOTs.

Then, survey respondents that noted they have received an incentive from their DOT were asked to provide examples of the incentive or bonuses they have received in their time working for the DOT. The responses collected from the survey included:

- Annual bonus,
- Salary increase/raise,
- Recognition of exceptional work,
- Professional development opportunities,
- Leave/time off flexibility,
- Work schedule flexibility,
- Project bonuses,
- Sign-on bonus,

- Education and tuition reimbursement,
- Longevity bonuses,
- Work-life balance opportunities,
- Relocation assistance,
- Reimbursement of professional registration dues,
- Bonus for recruiting employees, and
- Safety bonuses.

The variety of potential incentives and bonuses allow DOTs to be flexible in offering incentives for various levels and various positions within the DOT. Table 17 outlines the top five incentives received at each state DOT as stated by the survey respondents. The top two incentives received by the survey respondents are salary increase and recognition of work. This is followed by annual bonus and professional development opportunities. Other responses are reimbursement of professional dues, and flexibility with work schedule and leave/time off.

Table 17. The top common DOT incentives received.

No.	ArDOT	NMDOT	ODOT	TxDOT
1	Salary increase 33.7%	Recognition of work 50.0%	Recognition of work 22.6%	Salary increase 34.8%
2	Annual bonus 23.1%	Professional development 22.2%	Annual bonus 19.8%	Annual bonus 19.1%
3	Recognition of work 20.0%	Reimburse professional dues 16.7%	Salary increase 15.3%	Recognition of work 17.3%
4	Work schedule flexibility 7.6%	Work schedule flexibility 5.6%	Professional development 10.9%	Leave/time off flexibility 9.4%
5	Leave/time off flexibility 7.4%	Leave/time off flexibility 5.6%	Work schedule flexibility 8.1%	Professional development 7.4%

5.3.4. Professional Development

An incentive for employees is their DOT’s ability to help them advance their careers with new skills and knowledge. Professional development opportunities include training programs, education assistance, internships and mentoring, conferences and workshops, and peer information exchanges. Figure 7 shows that of the four DOTs surveyed, the survey respondents agree that each of the four DOTs do offer professional development opportunities. TxDOT has the highest agreement response rate at 92.6%, which can mean that TxDOT offers more career development options than the other DOTs. During the interview with TxDOT HR staff, the staff mentioned that TxDOT supervisors are responsible for showing employees the potential career path they can follow within their field. TxDOT also offers engineering assistance programs to help engineers gain their professional license and a formal mentoring program for younger employees.

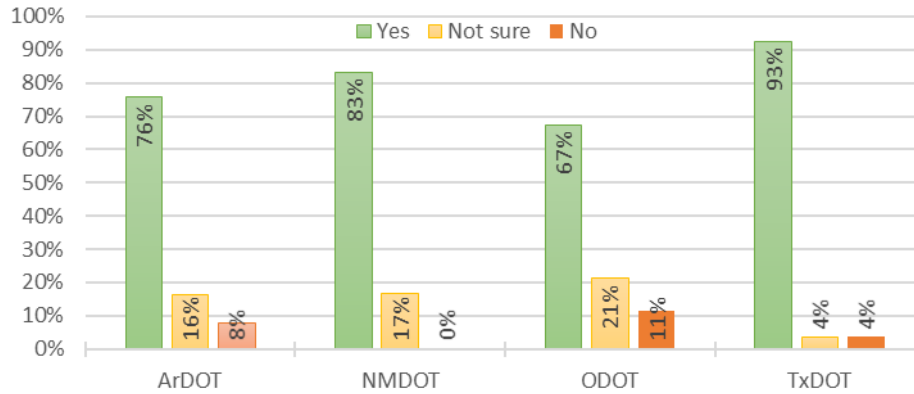


Figure 7. Professional development opportunities offered to current DOT employees.

Then, survey respondents that agreed that their DOT has professional development opportunities were asked about what types of professional development opportunities have they received from their current state DOT employer. The survey responses varied, but included the following:

- Structured technical and skills training programs,
- Structured management and leadership training programs,
- Online education and training courses,
- On-the-job training,
- Distance/video conferencing learning,
- Skills development workshops,
- Rotation of positions,
- Career development seminars,
- Internships,
- Attending transportation-related conferences and meetings,
- Technology/software training,
- Mentoring program,
- Roundtable discussions,
- Succession training,
- Participate in peer exchanges, and
- Safety training.

From these responses, Table 18 shows the top three professional development opportunities available to current DOT employees based on the Region 6 state DOT. The findings show that technical skills training is a typical professional development opportunity afforded to current DOT employees. Online training and management and leadership training are also commonly used professional development tools at state DOTs. Other responses include on-the-job training, distance/video conferencing learning, and skill development workshops.

Table 18. Professional development opportunities offered for current DOT employees.

No.	ArDOT	NMDOT	ODOT	TxDOT
1	Technical skills training 42.2%	Technical skills training 36.0%	Technical skills training 31.4%	Technical skills training 33.7%
2	Online education/training 25.7%	Online education/training 16.5%	Management & leadership training 22.2%	Management & leadership training 28.6%
3	On-the-job training 15.9%	Management & leadership training 16.4%	Online education/training 13.7%	Online education/training 14.6%
4	Management & leadership training 8.2%	Distance/video conferencing learning 9.3%	On-the-job training 12.4%	Distance/video conferencing learning 10.5%
5	Distance/video conferencing learning 6.1%	Skill development workshops 7.4%	Skill development workshops 6.3%	On-the-job training 8.1%

5.3.5. Working with the DOT Until Retirement

The issue of staff retention has become a problematic aspect that the HR department of state DOTs face on a regular basis. The situation is exacerbated by the lack of skilled workers to face the new challenges associated with technology that now characterize the labor market.

This climate makes organizations pay particular attention to retaining key personnel and provide the necessary means to captivate and convince them to remain within the organization.

To discover how current employees think about working at the DOT long term, the survey questionnaire inquired about the likelihood that a current employee would stay until they are eligible to retire. Figure 8 shows that at least 77% of the respondents at each state DOT would continue to work for the DOT until retirement. The average response rate for those that stated they are unlikely to work for the DOT until retirement is only 5.6%. This shows that, although DOTs are dealing with turnover and loss of employees (mostly due to retirement), most DOT employees indicated a strong tendency to finish their professional careers with their state DOT. However, it is important to point out that Figure 5 showed that the majority of the survey respondents (64% on average) are 40 years old or older, meaning that many survey respondents are within 15 years of retirement eligibility for a state employee and are not motivated to move to another firm and start over at this point in their careers.

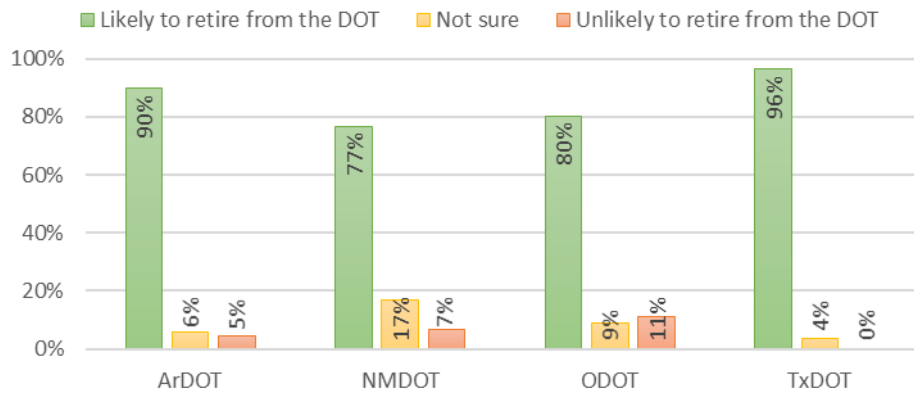


Figure 8. Likelihood of working for the state DOT until retirement.

Then, the survey queried the current employees as to which three factors would help increase the likelihood for them to stay with their DOT agency until retirement. Survey responses included:

- More salary opportunities,
- Improved retirement benefits,
- Promotion opportunities,
- Improved health benefits,
- Vacation/leave benefits,
- Flexible work schedule,
- Improved working conditions,
- Work-life balance opportunities,
- Challenging work assignments,
- Education benefits,
- Desire to perform public service,
- More diverse workforce,
- More responsibilities,
- Improved morale,
- Stable employment, and
- Close to retirement.

The significant retention factors for employees from each state are found in Table 19. More salary and compensation opportunities is the first factor for all four state DOTs, which shows once again the importance of offering similar compensation to other agencies and firms. Other top factors include improving retirement benefits, improving health benefits, promotion opportunities, vacation/leave benefits, and improved working conditions.

Table 19. Factors that increase the likelihood of DOT employees staying until retirement.

No.	ArDOT	NMDOT	ODOT	TxDOT
1	Salary opportunities 32.4%	Salary opportunities 35.0%	Salary opportunities 36.4%	Salary opportunities 22.2%
2	Improved retirement benefits 13.6%	Promotion opportunities 21.1%	Improved health benefits 19.5%	Improved retirement benefits 21.3%
3	Improved health benefits 12.8%	Improved retirement benefits 8.3%	Promotion opportunities 9.7%	Improved health benefits 15.4%
4	Promotions opportunities 11.5%	Improved health benefits 7.8%	Improved retirement benefits 9.0%	Improved working conditions 10.2%
5	Vacation/leave benefits 9.7%	Improved working conditions 6.7%	Vacation/leave benefits 8.0%	Vacation/leave benefits 9.3%

5.3.6. Reasons to Leave the DOT for the Private Sector

A survey question inquired from current DOT employees the likelihood that they would leave their current position at the DOT for a position with a private firm, which could potentially offer a higher salary. The data shown in Figure 9 indicates that, on average, 53.4% of the survey respondents are unlikely to leave the DOT for a private sector position in the next five years.

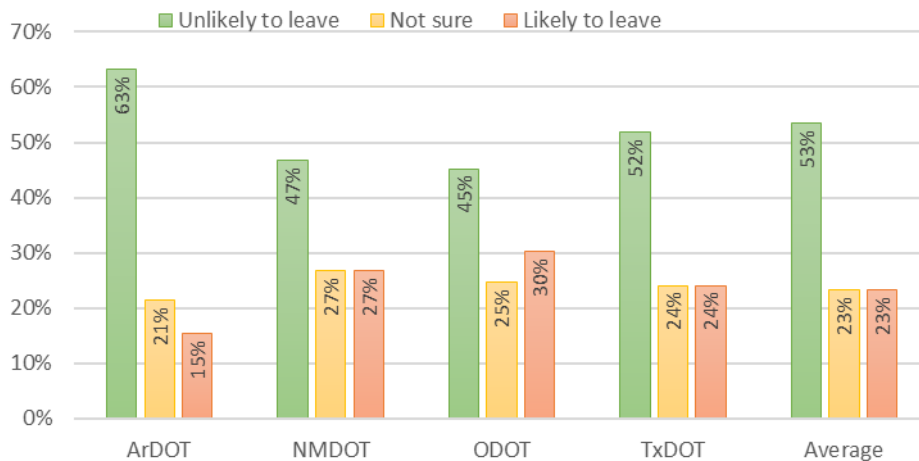


Figure 9. Likelihood of leaving for the private sector in the next five years.

State employees were also asked to rank the factors that would increase the likelihood of considering employment with a private sector firm. As shown in Table 20, there was consistency among the states for the primary and secondary factors: “better salary” and “promotion.” Obtaining a better salary correlates to the top factor that would entice current DOT employees to stay at their current DOT until retirement (see Table 19). Further, obtaining a promotion would increase the salary, and that correlates with the second factor that would potentially draw a current employee away from the DOT. Employees are concerned about their compensation and career advancement, and if they are unable to obtain that at their current DOT, then they may consider moving on to a private firm that can provide more compensation and promotion opportunities. Other factors stated include better working conditions, better health benefits, more flexible work schedule, more challenging work, fewer responsibilities, and better retirement benefits.

Table 20. Factors for current DOT employees to leave for a private sector firm.

No.	ArDOT	NMDOT	ODOT	TxDOT
1	Better salary 47.1%	Better salary 50.0%	Better salary 49.3%	Better salary 46.3%
2	Promotion 17.0%	Promotion 16.7%	Promotion 17.9%	Promotion 15.7%
3	Better working conditions 8.6%	Better working conditions 10.0%	Better working conditions 7.1%	Better health benefits 6.5%
4	Better health benefits 6.9%	More flexible work schedule 7.2%	Better health benefits 6.2%	More challenging work 5.2%
5	Fewer responsibilities 2.9%	More challenging work 3.9%	Better retirement benefits 3.4%	Better working conditions 4.9%

The “more flexible work schedule” responses as a factor to leave the DOT from NMDOT may be in response to a change made by the current state legislation, requiring everyone to work a five-day work week. As noted in discussions with NMDOT HR personnel, the previous state legislation allowed more flexibility in the work week.

5.4. Working for a State DOT

A portion of the survey questionnaire asked participants to rate specific statements that pertain to their working environment and perception of their current DOT employer. The statement items rated using a five-point Likert scale, ranging from strongly disagree (1) to strongly agree (5), are shown in Table 21.

Table 21. Statements rated by current DOT employees.

Statement No.	Perception Statement Item
1	My perception of my DOT agency was mostly positive before I was hired
2	My perception of my DOT agency today is mostly positive
3	My work is highly valued by my supervisors and peers
4	My work is highly valued by my DOT agency’s stakeholders and the traveling public
5	I feel like I am a valued employee of my DOT agency
6	If I were offered a job opportunity at another firm/agency, I would choose to stay in my current role at my DOT
7	My DOT agency has provided me with professional development opportunities
8	Employees that are effective tend to receive incentives within my DOT agency
9	Employees are able to be promoted based on performance within my DOT agency
10	Morale at my DOT agency is high today
11	Morale at my DOT agency is higher today than one year ago
12	Morale at my DOT agency is higher today than five years ago
13	I feel that I make a meaningful contribution to my DOT agency on a regular basis
14	I feel that I make a meaningful contribution to my state and community
15	I am proud to be a state employee

The statements address the areas of overall perception of their DOT, how valued they feel their work is to the DOT and external parties, professional development opportunities, promotions and incentives, overall morale, contribution made as a public agency employee, and if a current employee would leave their current DOT position for another firm if offered a position. For

simplicity in presenting the findings, the rating categories of “strongly agree” and “agree” have been combined into one category called “Agree,” while “strongly disagree” and “disagree” have been combined into one category called “Disagree.”

5.4.1. Employee Perception of the DOT

From the four Region 6 DOTs that participated in the survey, the overall perception of current employees before hiring and today is mostly positive (statements 1 and 2). Figure 10 shows the responses to the two perception statement items. Overwhelmingly, each state’s employees agreed that the DOT is a positive place to work as the results show that each state is 70% or higher in agreeing with how employees felt about their DOT before (Figure 10a) and after they were hired (Figure 10b).

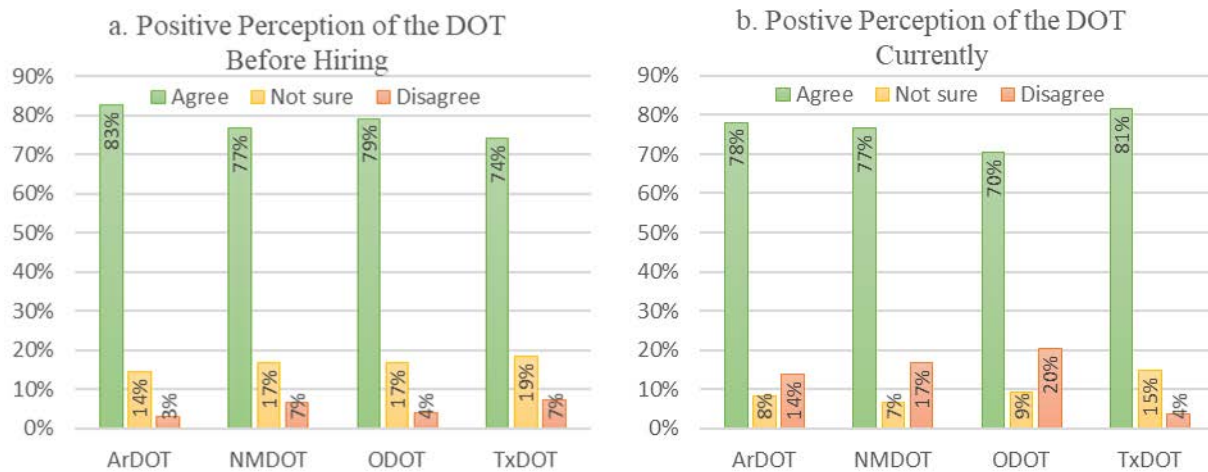


Figure 10. Perception of the DOT by current DOT employees.

5.4.2. Valued Work

In reviewing the responses to the three valued work statement items (statements 3, 4 and 5), the results show positive responses again that in fact, current employees believe that supervisors, peers, and external stakeholders value the work they perform. Figure 11 shows that most current employees agree that their work is highly valued. Figure 11a shows that current employees feel that their department highly values their work as each state agreed with this statement near or above 80% of the time. Figure 11b shows a slightly lower agreement that external stakeholders and the traveling public value their work, with Arkansas, New Mexico, and Oklahoma between 50% and 60% in agreement, while TxDOT had a higher valued work agreement at 80%.

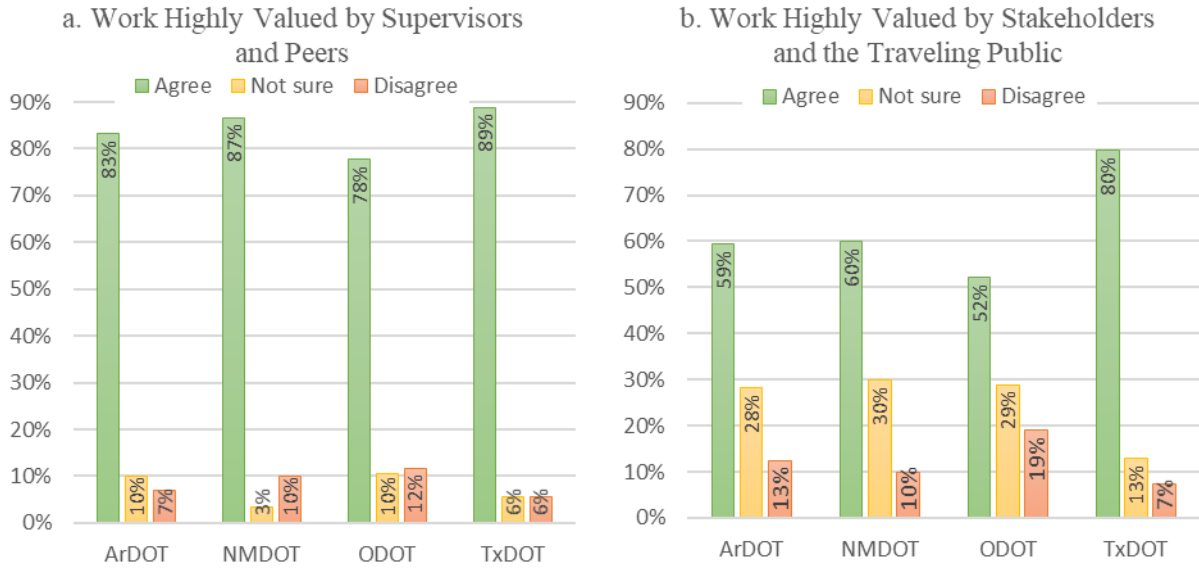


Figure 11. How the DOT and external entities value current DOT employees work.

Next, Figure 12a illustrates that the majority of the current DOT employees that completed the survey think that they are a valued employee and their DOT values them as a resource. Further, Figure 12b illustrates that most current DOT employees that responded to the survey would agree to stay at their current DOT if offered another job with another firm or agency. By far, employees at TxDOT feel more valued and would stay in their current position than the other three states. Overall, the importance of valuing employees is that DOTs can promote a level of loyalty that results in employees not considering leaving the DOT for another position.

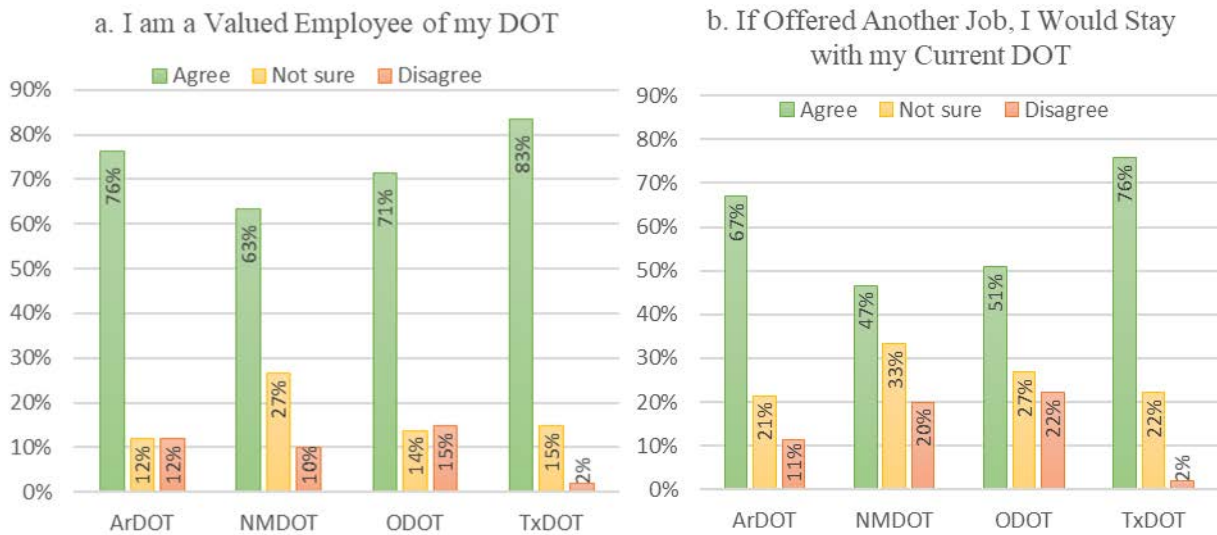


Figure 12. Measures of loyalty for current DOT employees.

5.4.3. Professional Development and Incentive Opportunities

Typically, state DOTs offer various professional development and incentive opportunities to further employees' knowledge and career with the DOT. For professional development (statement

6), which DOTs provide to employees to help them advance their skills and knowledge, Figure 13 shows that Arkansas (72%), New Mexico (87%), Oklahoma (68%), and Texas (83%) agree that formal professional development opportunities are made available to current employees.

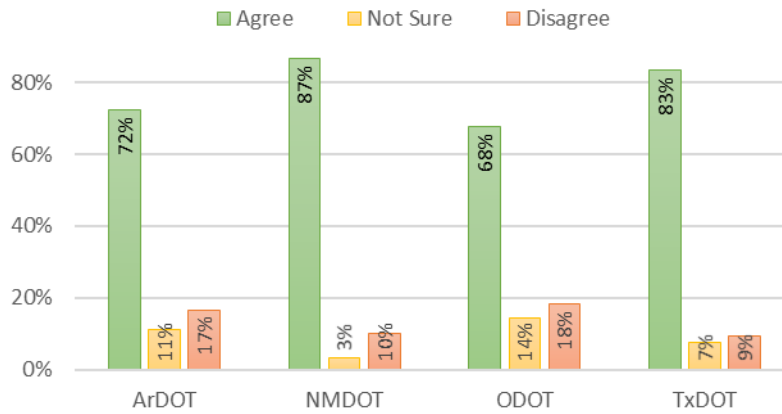


Figure 13. Current DOT employees offered professional development opportunities.

As for incentives and promotions (statements 7 and 8), the results of the survey show a mix of positive and negative findings, depending on the state DOT. In Figure 14 one can see that the frequency of disagree responses is higher for these two questions, as it shows that both NMDOT and ODOT disagreed with this statement, meaning current employees at these two DOT see that incentives are not specifically based on work quality or performance. ArDOT was a split between agree, disagree, and not sure, with agree (38%) slightly above the other choices. This shows that ArDOT employees are unsure of how incentives are awarded to employees, sometimes it could be quality work performance and other times it may not be. On the other hand, TxDOT employees (72%) noted that employees that are effective in their work tend to receive incentives such as bonuses. Overall, the 46% of the total responses disagree that effective employees receive incentives, while only 29% agree with this statement. DOTs may need to consider outlining to its employees the processes used for employees to receive incentives.

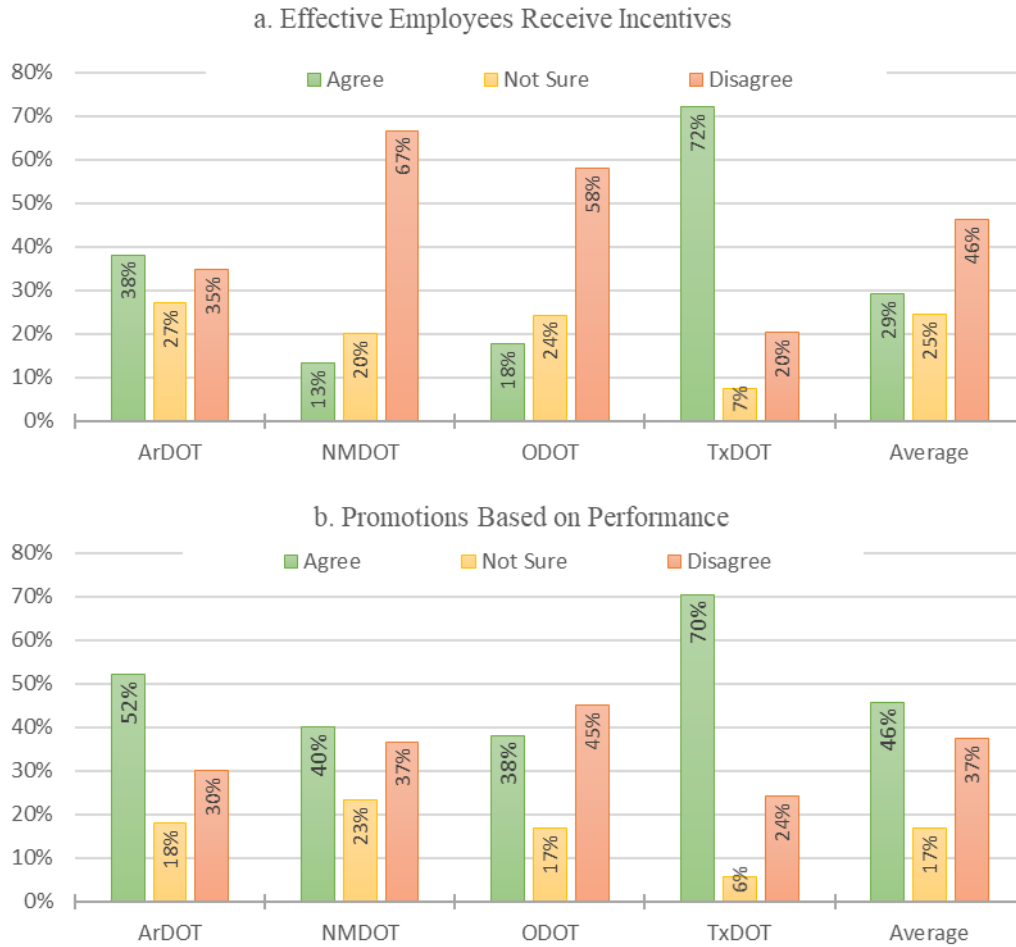


Figure 14. DOT employees' observations about who receives incentives and promotions.

Then, in Figure 14b, TxDOT again has a mostly positive response with 70% of current employees that responded to the survey agree that promotions are based on employees' performance. ArDOT also had the majority of responses agree that performance is a part of the promotion process with 52% agreeing. New Mexico shows a slightly agree frequency (40%) over disagree (37%), and Oklahoma has a higher disagree (45%) response rate than agree (38%). Overall, 37% of total responses think that promotions are not based on performance, while 46% agree. Therefore, one can see that promotions are not entirely based on performance and many agree that performance is not a key factor to promotions at DOTs.

5.4.4. DOT Agency Morale

Morale for a place of work is defined as a group of organizational members that come together persistently and consistently to achieve a common purpose (39). Morale represents the prevailing feeling among an organization's employees to work together and achieve common goals and objectives. When morale is low, employees do not have a sense of comradery and do not commonly believe in achieving organizational goals. On the other hand, when morale is high, employees have a sense of togetherness that everyone is trying to accomplish the same thing day in and day out. For the four DOTs responding to the morale statement items 10 through 12, Figure 15 shows the perception among current DOT employees on how the morale is within their

department today (Figure 15a) and comparing the morale level today with one year ago (Figure 15b), and five years ago (Figure 15c).

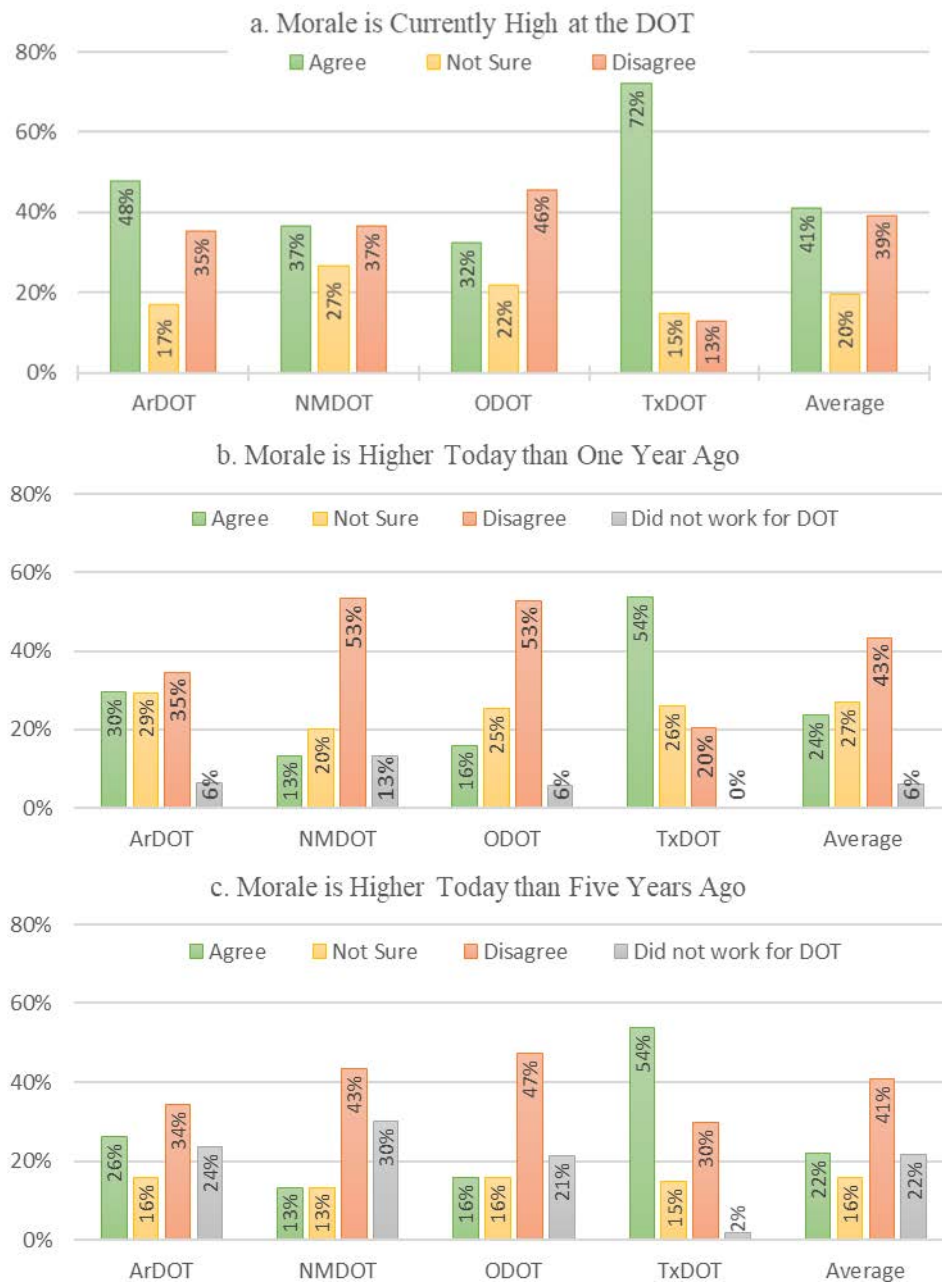


Figure 15. The level of morale found at four Region 6 DOT agencies.

In comparing the three charts in Figure 15, one can see that among the four states, only Texas shows that morale is better today than it was one year ago and five years ago. For New Mexico and Oklahoma, most employees think morale is not high today and is worse than it was one year ago and five years ago. For Arkansas, there is a common belief that morale is high currently but is lower than it was one year ago and five years ago. The average across all responses indicates that morale is believed to be high today by only 2% respondents than those that think morale is not

high currently. Out of a total sample size of 1,109, 2% is only 22 responses. Then, the consensus is that morale is lower currently than it was one year ago and five years ago.

Also, one should notice in Figure 15c, that, on average, about 22% of current DOT employees that responded to the survey have been hired within the last five years. The chart shows that New Mexico has approximately 30% new employees among the participating employees since five years ago. Arkansas and Oklahoma show that new employees are approximately 20% of the participating department staff. However, Texas only shows about 2% of new employees that responded to the survey have been hired in the past five years.

5.4.5. Working for a Public Agency

Working for a public agency makes an employee a public servant, providing services to improve the transportation system that the traveling public uses on a daily basis. In asking current DOT employees about working for a state DOT, overwhelmingly the respondents feel they are proud to be a state employee and contribute to their agency and the surrounding community. Figure 16 shows these results for statements 13 and displays that most Region 6 DOT current employees are proud to work for their DOT.

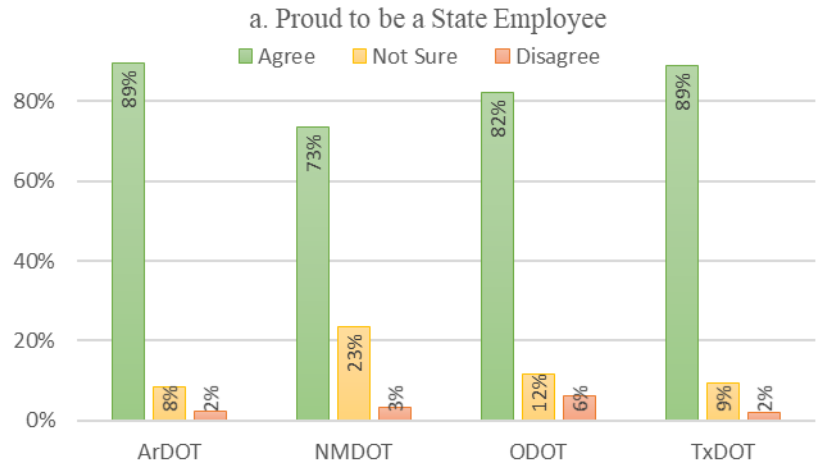


Figure 16. Current DOT employees' satisfaction in performing a public service.

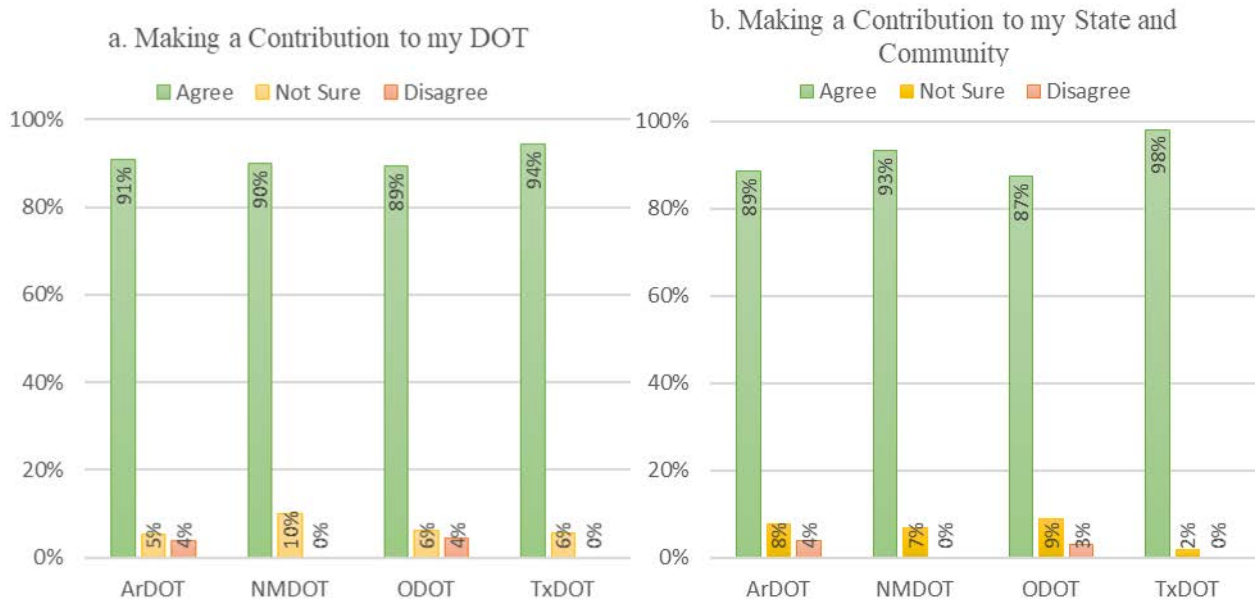


Figure 17. How current DOT employees work contributes to the agency and community.

Figure 17 illustrates as to how current DOT employees feel their work contributes to the DOT. For Figure 17a, Oklahoma DOT was the lowest in agreement that current employees contribute their DOT, but that frequency was 89%, which is quite high. The other three states that responded are 90% or higher. Almost all current DOT employees feel they do make a contribution to their DOT in regards to the work they perform. In Figure 17b, the results are similar to Figure 17a, in that each state respondents agreed at least 87% that their work contributes to their state and surrounding community. Current DOT employees believe that their work makes the transportation system better, which translates to better conditions for the traveling public.

5.5. Relative Importance Index

Based on the survey responses to the perception statement items listed in Table 21, the overall responses were analyzed using the relative importance index (RII) method. Since the current DOT

employee survey used a Likert scale for the perception statement items ranging from one to five, with one (1) indicating strong disagreement and five (5) indicating strong agreement, the RII can provide statistical evidence of the agreement and disagreement with the responses to the perception statement items. RII is calculated using the following equation:

$$RII = \frac{\Sigma W}{A \times N} \quad [1]$$

where:

“ ΣW ” indicates the sum of the weighting given to each factor (e.g., one to five) multiplied by the number of responses for each factor,

“A” is the highest weight possible (e.g., five), and

“N” is the total number of respondents to the question, which varies based on the sample size of each DOT as shown in Table 6.

Table 22 summarizes the RII values for each perception statement item across each state DOT.

Table 22. RII values from each state DOT for the 15 perception statement items.

Statement No.	Perception Statement Item	ArDOT	NMDOT	ODOT	TxDOT
1	My perception of my DOT agency was mostly positive before I was hired	0.892	0.860	0.877	0.856
2	My perception of my DOT agency today is mostly positive	0.819	0.793	0.767	0.870
3	My work is highly valued by my supervisors and peers	0.854	0.867	0.824	0.904
4	My work is highly valued by my DOT agency’s stakeholders and the traveling public	0.745	0.740	0.693	0.822
5	I feel like I am a valued employee of my DOT agency	0.819	0.780	0.788	0.893
6	If I were offered a job opportunity at another firm or agency, I would choose to stay in my current role at my DOT	0.790	0.673	0.700	0.848
7	My DOT agency has provided me with professional development opportunities	0.778	0.813	0.753	0.874
8	Employees that are effective tend to receive incentives within my DOT agency	0.588	0.413	0.446	0.759
9	Employees are able to be promoted based on performance within my DOT agency	0.660	0.587	0.557	0.770
10	Morale at my DOT agency is high today	0.620	0.567	0.547	0.767
11	Morale at my DOT agency is higher today than one year ago	0.562	0.454	0.460	0.693
12	Morale at my DOT agency is higher today than five years ago	0.547	0.467	0.447	0.691
13	I feel that I make a meaningful contribution to my DOT agency on a regular basis	0.924	0.933	0.908	0.956
14	I feel that I make a meaningful contribution to my state and community	0.911	0.947	0.897	0.959
15	I am proud to be a state employee	0.919	0.833	0.864	0.926

The RII was used to rank the level of agreement for each of the perception statement items to find the importance of the statement item relative to the responses given by the survey respondents. The closer the calculated RII is to 1.0, the stronger the agreement is with the question. If the RII is low, that means that there is strong disagreement with the question. Questions with low RII

results indicate the driving factors toward a negative perception of DOT work. Mid-range scores indicate inconsistency concerning the statement item as responses are somewhat evenly distributed. The RII values shown in italics in Table 22 are the values indicating a trend towards a negative disagreement response to those perception statement items.

Arkansas, New Mexico, and Oklahoma DOTs show a more negative response to statements eight through 12. This shows additional evidence that promotions and incentives are not necessarily based on employee performance and the morale at these three DOTs is lower today than it was one year and five years ago. On the other hand, TxDOT had higher RII values on average for all perception statement items. For statements eight and nine, TxDOT had a positive response that employees receiving promotions and incentives occur based on their performance. This shows inconsistency across the DOTs on how employees receive incentives and promotions since the TxDOT results are opposite to the other three DOTs results. Overall, TxDOT had the highest RII values, indicating a more positive employee perception of their DOT than other agencies.

6. CONCLUSIONS

Throughout this research project, the objective was to identify the existing workforce issues and examine the recruitment and retention practices offered by the state DOT agencies from Region 6 to determine which methods have the potential for implementation in other transportation departments. However, due to the unique characteristics of each transportation agency, it is difficult to determine which practices are more successful or are of greater value than others. What works at LaDOTD may not work at TxDOT and vice-versa.

As expected, state DOTs cannot compete with other businesses, especially those in the private sector, regarding salary offers and compensation. The findings from this research noted that the positions of engineers, equipment operators, maintenance personnel, surveyors, and inspectors are difficult positions to fill as private firms offer more money for these positions. However, state DOTs are using other tools to overcome this difference, such as ArDOT quantifying the benefits offered along with the salary to recruits to show them that their salary, along with benefits, is on par with private companies. LaDOTD uses a special entrance pay system that provides incoming recruits with a higher salary than the minimum for that job classification. Other tools include offering flexible work weeks, LaDOTD and ODOT offer, annual bonuses and special recognition compensation used at TxDOT, and the use of other incentives such as training programs, work-life balance, education assistance, and a plethora of health and retirement benefits that typically out-match private firms' benefits.

Although state DOTs share similar characteristics and activities, they differ in many elements. The five state DOTs studied have a high degree of diversity concerning size, jurisdictional responsibilities, political organization, demographic characteristics, turnover positions, and professional profile. State DOTs must also adapt to internal and external social, economic, and political factors. As different as they are, transportation agencies face complex workforce issues that are exacerbated by the high levels of anticipated retirements and the need for new workforce skills required to face advanced technologies. An average of the overall trend in all four states shows that about 34% of state employees are already eligible or could retire within the next five years.

There are three generations currently working for DOTs: Baby Boomers, Generation Xers, and Millennials. As a result of these generations and associated generational difference, the organizational structures for DOTs are being redefined in respect to authority, workload, work schedules, and work ethic. Also, generational differences are affecting different dimensions of HR practices including recruitment, employee motivation, and retention. Managing a diverse workforce demands an inclusive approach, which integrates the value systems of all groups. When consulting state agency HR staff about the actions that each carried out in this regard, most agreed that to attract and retain talent, development and learning opportunities within the department are essential, as well as competitive compensation and career opportunities without discounting flexibility practices and leadership styles aligned with the profiles sought.

In discussions with the five Region 6 DOT HR staff, there are many different strategies and tools used to help with recruitment efforts. Recruitment is a multidimensional and complicated process; yet, state agencies share common approaches to recruiting qualified personnel. The agencies communicate the excellent benefits offered by state employment and embrace the use of websites and social media for recruiting efforts to reach a broad younger audience. In addition, the state DOTs regularly participate and engage in job fairs at various universities and colleges in the

southern U.S. to actively recruit potential applicants and hire unrepresented minorities to promote diversity. In reviewing the factors that influence employees to join DOTs, the employees from the four states had the following priorities for recruitment: health benefits (32.93%), retirement benefits (30.38%), and stable employment (37.4%).

Employee retention is another issue facing the DOTs in their workforce development. The most noticeable theme expressed by all the interviewees is that state DOTs are experiencing high turnover rates among the positions of engineers and maintenance professionals. DOT HR staff cited competitive labor-market conditions as a key contributor to the difficulty in recruiting and retaining employees for high demand positions. The constrained budget of public agencies restricts them from providing higher or similar salaries to those of the private sector. There were strong indications from the employees responding to the survey that better salary opportunities and promotion opportunities were the primary incentives when considering private-sector employment. However, state DOTs providing special compensation or bonus programs can potentially retain employees more successfully than those where such options do not exist. As a result, DOTs implement holistic recruitment and retention strategies that entice and persuade different generations of the benefits and potentials they would gain by working in the transportation agency. The use of incentives, such as quantifying the total benefits package along with a salary, promotes that DOTs can offer similar compensation to private sector firms.

One topic that should be recognized is that some employees are very unlikely to leave the agency in the next five years and indicate a strong tendency to finish their professional careers with their state DOT. However, a certain percentage will eventually leave state employment, as the majority of the workforce is aging and retiring at a rate faster than new employees can be hired.

7. RECOMMENDATIONS

The data collected for this project includes literature from DOTs, journal articles, and associated reports along with interviews of HR personnel, a survey of current DOT employees, and a questionnaire for former DOT employees. Based on the data collected and the findings discussed in the previous chapter, the information below outlines the recommended strategies for DOT HR departments to consider for implementation to assist with recruiting and retaining quality employees.

7.1. Recruitment

Based on the findings of this research, the following recruitment strategies are recommended to state DOTs in order to attract highly competent and qualified staff.

7.1.1. Use of Social Media and Internet Sources

DOTs to consider having internet and social media presence for advertising and recruiting individuals to work for the agency as well as to note positive and encouraging information from the DOT to improve loyalty and retention efforts.

Transportation departments should consider developing an online presence, including the use of social media to recruit young workers from today's current workforce. The benefit of online recruitment tools is that it allows transportation agencies to reach a broad audience at a relatively low cost (11). There are many different online sources that DOTs can use to recruit employees, such as:

- DOT agency website,
- Government jobs websites, such as USAjobs.com,
- Organizational websites, such as the American Society of Civil Engineers Career Connections,
- Job aggregator websites, such as Indeed.com, Glassdoor.com, and Jobs.com, and
- Social networking websites, such as Twitter, Facebook, and LinkedIn.

The survey results show that websites and social media are the second most common way that current state DOT employees found out about employment at a DOT, as noted in Table 10. About 20% of current DOT employees that responded to the survey found out about the DOT and their position through websites and social media. In fact, finding out about a job through the internet is 10% more likely than finding out about a DOT job through a college or university. DOTs actively recruit from colleges and universities, so it is surprising that more people find out about DOT employment from the internet than from higher education.

7.1.2. Quantify Offered Benefits along with Salary

Include a quantified value of benefits along with the starting salary to be on par with private sector firms.

In many cases, the salaries paid in the public sector are significantly lower than those offered in the private sector, which tends to draw away quality candidates (38). However, the overall benefits offered to employees at the DOT agencies are typically greater than those offered in the private sector. Thus, research recommends transportation agencies offer competitive benefits packages along with career development opportunities and a healthy work-life balance to encourage employee retention (8). For instance, all the state DOTs offer competitive benefits that include sick and vacation leave, health-life insurance, and a retirement program with a match of funds by

the state. ArDOT currently quantifies the benefits package along with salary, which works well for engineering positions.

In addition, state DOT employees from Arkansas, Louisiana, Oklahoma, and Texas can work flexible hours during the week. Education assistance programs exist for those pursuing advanced studies at the state DOTs in Louisiana, New Mexico, Oklahoma, and Texas. Quantifying these types of benefits offered can then show recruits that compensation is similar to what they would make at a private sector firm.

7.1.3. Promote the Importance of Working for a Public Agency

Highlight to recruits the importance and job satisfaction one will achieve by working for a public transportation agency.

Many of the current employees surveyed noted that their work is valued by their supervisors and the traveling public (Figure 11) and that they are proud to work for a public agency (Figure 12). One positive encouragement to potential recruits is to promote that the work performed helps the greater society. The motivation to accomplish work that benefits others can be enticing to younger generations that are looking for challenging, and impactful work and responsibilities. Although making money is a significant reason for a job, making a difference tends to motivate some towards working for public agencies.

7.2. Retention

The following retention strategies are recommended to state DOTs.

7.2.1. Offer Flexible Work Schedules

Provide the option to employees to work a flexible 40-hour per week schedule to balance work and life.

One of the main findings from younger generations was that individuals prefer the option to work a flexible schedule to have better work-life balance. The younger workers from newer generations tend not to want a traditional five-day, 40-hour work week. Younger workers enjoy the freedom of working when they want so that they can attend and participate in activities outside of work when needed. Although a non-traditional work week could result in fewer days working, the number of hours per week does not change.

With a flexible work schedule, employees have the flexibility to work their required hours, but at their pace and when it works best for their schedule. However, providing the flexible working options, such as working a four-day, 10-hour per day schedule, allows employees to have a more extended weekend to enjoy family and life outside of work and establishes an incentive that can drive loyalty among current employees. However, allowing all DOT employees the freedom to work when it is best for their schedule will not work for all occasions and may not align with state regulations, as shown with NMDOT. The previous New Mexico state governor and state legislation allowed state employees to work a flexible work schedule. However, this policy changed back to a traditional schedule with the new governor, and now all DOT employees work a five-day, 40-hour week. This situation has caused some frustration, including some employees leaving NMDOT because of this, with the employees that have been there since the previous governor's regime. As this shows, providing more freedom to employees is something that DOT employees want. Meeting the needs of employees will go a long way for DOTs to hold onto the employees they need for a long period of time.

7.2.2. Base Promotions and Incentives on Employee Performance

Conduct and review employee performance evaluations for possible promotion and incentives to award high performing employees.

As with most employers, performance evaluations provide DOT supervisors with a tool to know how well each of their employees is doing in their work. In many cases, incentives such as raises and time off as well as promotions are based on results of performance evaluations. The responses to the survey in regards to who within the DOT receives incentives and promotions illustrated that performance is not the primary factor for receiving a bonus or a promotion (see Figure 14). However, DOT HR personnel mentioned various structured promotion processes within the DOT as well as noting special compensation such as receiving extra compensation for special recognition. The disconnect in the data shows that a clear understanding of the promotion opportunities and when one can receive an incentive is lacking with the Region 6 DOTs. DOTs should consider structuring potential incentives and promotions for each employee on an annual basis so that they know what they can achieve.

7.2.3. Improve Morale Department-Wide

High morale among employees can create a productive and enjoyable workforce that can entice potential employees to work for the DOT and to keep current employees from leaving.

As noted earlier, Baby Boomers, Generation Xers, and Millennials find job satisfaction if the workplace culture is positive. Although the consensus from the survey results show that most employees are proud to work for a public agency and that their peers, supervisors highly value their work, and the traveling public, the morale at DOTs was shown to be lower today than a year ago and five years ago, except for TxDOT (See Figure 15). This should be a concern to state DOTs as low morale means an unpleasant working environment, which leads to people looking elsewhere for employment in some cases. Some of the comments collected in the survey state office politics, toxic work conditions, and favoritism as issues that have some survey respondents considering finding another job. As shown in Tables 19 and 20, improved working conditions is a factor that would entice current DOT employees to stay at the DOT long term and not consider leaving for another position with another firm. Although it is challenging to appease everyone, improving working environments can go a long way in establishing loyalty so that current quality employees do not even consider leaving the DOT.

7.2.4. Require Entry-level Employees that Obtain a License to Remain with DOT

Make employees that work toward and obtain a license through their DOT stay with their DOT for a set duration so that the DOT can reap the benefits from their investment.

A practice used by DOTs is to help entry-level individuals to obtain licenses required for their position. However, as noted in the HR interviews, DOTs are having a hard time keeping these employees once they obtain their license. For example, entry-level maintenance personnel typically need a CDL. State DOTs can help and pay for an employee to get their CDL. However, once these employees have their CDL, they leave the DOT for a private firm that pays a higher hourly wage. To avoid situations such as these, DOTs should consider invoking a process where individuals that obtain a license using DOTs funds and time must stay with the DOT for a set period of time. The duration that newly licensed employees must stay at the DOT should be based on the level and time and cost involved in obtaining the license. Having employees obtain

necessary licensure is an investment by DOTs, which operates on public funds. DOTs need to gain the advantage from that investment before that person leaves and takes the benefits with them.

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APPENDIX A: CODING STRUCTURE FOR CONTENT ANALYSIS

Tier I	Tier II	Tier III
Recruitment	Compensation	Benefits, pay allowances, pay scales, premiums, raise, salary
	Skill Sets	Communication, competency, leadership, management, problem-solving, team player
	Experience	Abilities, educational background, knowledge, soft and technical skills
	Advertisement	Career orientation activities, internal intranet site, internship programs, job announcement, job fairs, local and state government entities, newspaper, websites, positive public image, recruitment letters, referrals, social networking, technical schools, colleges and universities, transit-only publications
	Internal Hiring	Internal transfer, organizational transparency, promote within
	Job Description	Amount of stress, benefit packages, duties performed, flexibility, hours and number of days worked, realistic job previews, salary, system mission, talent acquisition, training opportunities, workplace environment
Training and Development	Programs	Courses, electronic learning techniques, human resource training, in-house and external training, job rotations, mandatory training, online training, on-the-job training, seminars, webinars
	Succession Planning	Coaching, competency, increase organizational commitment, job satisfaction, mentoring
	Performance Appraisals	Appraisal, boost morale employees, constructive feedback, determines compensation packages, motivation, performance evaluation, salary raise, wage
	Cross-departmental Training	Add challenges, expand skill sets, knowledge
	Development Plans	Career goals, expectations, individual interest, professional development, special projects and assignments
	Performance Metrics	Acknowledgment, constructive feedback, job satisfaction, job security, rewards, special distinctions
Retention	Rewards Programs	Bonuses, cash rewards, choosing assignments, choosing days off, commissions, health plans, pension plans, raises
	Competitive Benefits	Commuter benefits, deferred compensation, employee development programs, health insurance, leave, on-site child care, retirement plans, tangible support, training opportunities, tuition reimbursement
	Work-life Balance	Community ownership, flexible work schedules, growth opportunities, holidays, leisure activities, vacations, variable day schedules, variable week schedules, work environment
	Culture	Accomplishment, acknowledgment, autonomy, culture of ownership, decision making, employee diversity, generation differences, high morale, mentorship, positive organizational culture, promotions, recognition, responsibility, teamwork, work environment
	Training and Development	Engage employees, keep training fresh, promote from within
	Leadership	Communication, employee involvement, engage employees, include employees, inform job responsibilities and expectations, scheduled meetings, share plans, weekly and monthly newsletter

APPENDIX B: STATE DEPARTMENT OF TRANSPORTATION HUMAN RESOURCES INTERVIEW QUESTIONNAIRE

Section I – Interviewee Information

1. Interviewee Information

Name: _____

Agency: _____

Phone/Email: _____

2. What is your current position/title at your DOT?
3. How long have you worked for your DOT?
4. How long have you worked in your current position at your DOT?

Section II - Recruitment

5. How does your DOT advertise open positions (e.g., websites, job fairs, social media, newspapers/magazines, universities/colleges, etc.)? What strategies does your DOT use to increase the number of applicants for an open position (e.g., social media, using current DOT employees, etc.)?
6. In general, how long does it take to fill an open position? What positions are currently easy to fill? What positions are currently difficult to fill? What positions do you think your DOT will struggle to fill in the future?
7. Describe some of the strategies/incentives (e.g., training, education opportunities, salary and benefits, work-life balance) your DOT has used for recruiting for various positions. How have these strategies impacted your hiring efforts? Which strategies seem to be the most effective?
8. What training programs are available/required for new hires?
9. What strategies or policies are in place for recruiting women and minorities for DOT employment (DOT or state-specific policies/strategies)?

Section III - Retention

10. Which positions do your DOT currently struggle with in terms of keeping employees?
11. Describe some of the strategies/incentives (e.g., training, education opportunities, salary and benefits, bonuses, work schedule and leave flexibility, recognition of work, etc.) your DOT has used to retain current employees. How have these strategies impacted your retention efforts? Which strategies seem to be the most effective?
12. What are the professional development programs available/required for current employees? How often are employees required to take the training (monthly, annually, as desired, as available, etc.)?

13. When an employee leaves your DOT, is an exit interview conducted? Would you be able to provide information from the exit interviews to the research team?
14. Does your DOT collect information on why employees leave your DOT? If yes, what factors (internal or external) are causing professionals to leave your DOT (e.g., lack of raises, lower benefits, culture change within the DOT)?
15. What proportion of employees that leave your agency go to a private firm? What proportion leave for another public agency?
16. What factors (internal or external) are increasing the likelihood of professionals staying with your DOT?

Section IV - Promotion

17. How does your DOT help employees create professional/career development plans to further their knowledge and potential for promotion?
18. What is the process that your DOT uses to promote employees?
19. How are promotions used as an incentive to hire and keep DOT employees?
20. How often are current employees promoted?

APPENDIX C: SUMMARY OF FINDINGS FROM DOT HR STAFF INTERVIEWS

RECRUITING	Arkansas	Louisiana	New Mexico	Oklahoma	Texas
Job Advertisement	Online workforce talent acquisition website Social media: Twitter, Facebook, LinkedIn Newspapers Universities and colleges Other: ASCE, Indeed, Glassdoor	Civil services websites Advertisements Universities and Colleges NO social media	Use of NeoGov Social media: jobs.com Job fairs Universities and colleges Churches and social groups Other: Banners at NMDOT yards across the state Potential hires have to apply through the state personnel office	Websites Social media Jobs fairs within their district Newspapers/magazines Universities/colleges Other: headhunters for engineering positions and job boards for technical divisions	Websites Social media Jobs fairs within their district Government inside magazines, diversity magazines, and engineer magazines
Time to Fill Open Position	30 to 90 days	Depends on the job position Entry level 5-15 days Administration trades and engineers 6 days	average of 67 days	minimum of 60 days but can take up to 4-5 months	Depends on the job position
Positions Difficult to Fill	IT positions, engineers and engineer techs, maintenance staff	Engineers and engineer technicians, trade positions, entry levels, and mobile equipment operators. Easy to fill: administrative, accounting, and procurement.	Difficult positions: engineers, surveyors and maintenance personnel in remote/rural areas	Difficult positions: GIS positions, technical positions such as engineers and transportation specialists, fleet specialists, transportation equipment operators, mechanics.	Difficult positions: engineer, supervisors roles, high-level inspecting positions Easy positions: entry level

RECRUITING	Arkansas	Louisiana	New Mexico	Oklahoma	Texas
Strategies/Incentives	Great benefit packages Assign a dollar value for the benefits a new hire will receive	Uses a special entrance pay rate that is above the minimum pay range. Offers tuition reimbursement and education leave time. Flexible leave policy and flexible work schedules.	Tuition reimbursement Helps maintenance staff to obtain license such as CDL and GED Retirement package Annual leave Health insurance which includes medical, dental, and vision.	Offers internships in the summer for college students. Holds a “Transportation Day” to high school students. Flexible work schedules Support employees to obtain required certifications	Offers training Tuition assistance program Salary and benefits Work-life balance program Wellness programs and medical bill Retirement package
Training Programs	Exploring online training similar to Lynda.com Mandatory State training Safety training and certification training	For training and education classes to employees the Louisiana Transportation Research Center is used. Web-based training Offers SOP	TTPC training for field work training	In-house training: new employer orientation Online training	In-house training: newer employer orientation Classes specific to their job title like construction gear classes, maintenance gear classes, accounting, finance.
Policies for Recruiting Women and Minorities	Black colleges such as PVAMU and Southern University Recruits civil engineering grads Provides internships to minorities and women	Recruits at Southern University in Baton Rouge. Nothing specific use to recruit women. Do not target for technicians that speak Spanish.	Follow EEO requirements	Recruiting cycle for engineers at universities such as Kansas, Arkansas, and Missouri. There are NO state or department specific policies for recruiting minorities and women. Adheres to the federal Equal Employment Opportunities (EEO) requirements when hiring individuals.	Advertise in diversity and women’s magazines Reach out to different organizations such as National Society of Black Engineers Reach out to colleges and high schools

RETENTION	Arkansas	Louisiana	New Mexico	Oklahoma	Texas
High Turnover Positions	IT positions, entry level maintenance workers, engineers and engineer techs	Engineers and engineer techs	Engineers, surveyors, maintenance personnel	Engineering positions, maintenance and technician positions.	Construction inspectors, pavement engineers, and maintenance technician (compete with the oil industry)
Strategies/Incentives	Performance-based pay system Bonuses and raises Provide certification training NO tuition reimbursement or education assistance	Tuition reimbursement and education leave time Annual DOT Recognition Program Offer monetary awards and service awards		Longevity bonuses Tuition reimbursement for classes/education Employee appreciation day	Increase salary and bonuses Work schedule and leave flexibility Tuition assistance programs Longevity pay Help engineers to get their certification Promotion opportunities
Professional Development Programs	Certification training available Encourages the use of a career development plan	Uses a critical task program that IDs specific tasks and work.	Provides cross-training	Doesn't have a succession planning. Helps employees to develop a career progression. Working on a component of succession in the hiring process for use in hiring in the future. Provide support for certifications and assistance for EI to get to the PE level.	Personnel are responsible for employees to show what career path can take within their currently field. Engineering assistance program: help graduate students to get their professional engineer license. Pay for all the training but not for the test. Reimbursement programs if employees decide to take other classes. Mentoring programs mostly for engineering assistants.

RETENTION	Arkansas	Louisiana	New Mexico	Oklahoma	Texas
Exit Interview	Yes, exit interviews are used to ask employees why are they leaving. One of the main factors employees leave is money.	Voluntary questionnaire used. One of the main factors employees leave is money.	Yes, exit surveys are used.	Yes. Most of the time is due to salary. Voluntary exit surveys are used for people that leave the DOT.	Yes, everyone does an exit interview with their supervisors. Most of the time employees leave due to salary.
Proportion of Employees that Leave the Agency	Not sure	Do not have an approximate number.	Review exit survey information	Not sure.	Do not have the statistics.
Factors for Employees for Staying at the Agency	Not sure of the factors that are increasing the possibility of professionals staying within the DOT. However, factors that are decreasing that possibility include: employees retiring, no succession plans for soon to be retirees.	-	Moved all entry level highway maintenance workers up to the midlevel salary. Other positions are seeing a salary increase	Not sure of the factors that are increasing the possibility of professionals staying within the DOT. However, factors that are decreasing that possibility include: employees retiring, cost of living raise, oil companies.	Great benefits, insurance, retirement plans, work-life balance STABILITY within the organization

PROMOTION	Arkansas	Louisiana	New Mexico	Oklahoma	Texas
Professional/Career Development Plans	Uses a engineer career path. Helps engineers obtain PE.	Offers a mentorship program. Encourages the development of a career development plan based on annual performance reviews.	Supervisors will work with their employees to develop a career path within the DOT.	Implemented a career progression plan: manager meets with each employee to find out what their interest are and discuss what training they might need to get to that different field.	Employees need to talk with their supervisor monthly to further their career (mentorship programs).
Process to Promote Employees	Advertise positions internally through their website.	Based on job classification and are advertised internally and externally.	Union position must be externally advertised for at least 14 days	There is an authorized level for every position at ODOT	Job posting program, career program.
Promotions as an Incentive	Use performance-based pay system as an incentive.	Career Progression Program is used as an incentive in the employment recruitment process. Employees can advance professionally without competing.	-	Annual employee evaluations are used as a performance management program.	Use promotions as an incentive but the position is competitive.
Frequency Current Employees are Promoted	Depends on the position and the work.	Dual Career Program allows engineering techs and professional engineers to attain a level of pay and responsibility that is comparable to supervisor level. The four-level program allows employees to advance based on certain criteria and annual performance reviews.	Depends on the position and the work.	Happens all the time.	Wide-range because it depends on the position.

APPENDIX D: SURVEY QUESTIONNAIRE FOR CURRNET STATE DOT EMPLOYEES

The goal of this study is to investigate practices for recruiting and retaining employees at state Departments of Transportation (DOTs) to determine strategies for DOTs to recruit and retain quality employees as well as to develop outreach, educational, and workforce implementation strategies to expose and encourage future and current construction professionals to consider employment by a DOT. Your participation is vital to this research as your input will help to develop best practices and strategies for DOTs to recruit better, retain, and promote current and future DOT employees. This research is a collaborative effort between Louisiana State University, the University of New Mexico, and Prairie View A&M University, which are a part of the Region 6 University Transportation Center called Tran-SET. The focus of this study is the five DOTs located within Region 6 (Louisiana, Arkansas, Texas, Oklahoma, and New Mexico). This survey questionnaire contains three sections:

- Section 1 – General overview
- Section 2 – Hiring, Retaining and Promoting
- Section 3 – Perception of your DOT

The survey should take approximately 15-20 minutes of your time, and it is recommended that you complete the survey all at once. Your participation is voluntary, and your responses will be kept confidential. If you have any questions or concerns about this survey or this research project, please contact Christofer Harper (Louisiana State University) at 225-578-0131 or by email at charper@lsu.edu. Your expertise and experience are critical to the success of this project. We thank you in advance for your time and thoughtful consideration.

I understand the above information and voluntarily consent to participate in the survey questionnaire.

- a. Yes, continue with the survey
- b. No, opt out of the survey

Section 1 – General Overview

1. Which DOT agency do you work for?
 - a. Arkansas
 - b. Louisiana
 - c. New Mexico
 - d. Oklahoma
 - e. Texas

2. What is your current position at your DOT agency?
 - a. Engineer
 - b. Technician
 - c. Project management
 - d. Operations
 - e. Maintenance
 - f. Administration
 - g. Upper management
 - h. Intern
 - i. Temporary position
 - j. Other (please state): _____

3. What was your position at you DOT agency when you were hired?
 - a. Same as current position
 - b. Engineer
 - c. Technician
 - d. Project management
 - e. Operations
 - f. Maintenance
 - g. Administration
 - h. Upper management
 - i. Intern
 - j. Temporary position
 - k. Other (please state): _____

4. In what year did your DOT agency initially hire you? _____

5. How long have you worked for your DOT agency?
 - a. Less than 1 year
 - b. 1-5 years
 - c. 6-10 years
 - d. 11-15 years
 - e. 16-20 years
 - f. 20+ years

6. How long have you worked in your current position at your DOT agency?
 - a. Less than 1 year
 - b. 1-5 years
 - c. 6-10 years
 - d. 11-15 years
 - e. 16-20 years
 - f. 20+ years

7. How did you find out about employment with your DOT agency?
 - a. Website
 - b. Job fair
 - c. College/University
 - d. Newspaper/Magazine
 - e. Recruiter
 - f. Social media
 - g. Relative or friend already worked for the DOT
 - h. Do not remember
 - i. Other (please state): _____

8. How many hours, on average, do you typically work during a week?
 - a. Less than 25 hours per week (part-time)
 - b. 25-34 hours per week
 - c. 35-44 hours per week (full time)
 - d. 45-54 hours per week
 - e. 55 hours or more per week

9. Do you take work home with you?
 - a. Yes
 - b. No

10. If you were to take work home with you, how often would you do that?
 - a. Daily
 - b. Weekly
 - c. Monthly
 - d. As needed
 - e. Never

11. How many years from now are you eligible to retire from your DOT agency?
 - a. 0 years (already eligible)
 - b. 1-5 years
 - c. 6-10 years
 - d. 11-15 years
 - e. 16-20 years
 - f. 20+ years

12. What is your highest level of education?
 - a. High school
 - b. Some college
 - c. College undergraduate degree
 - d. Some graduate work
 - e. Graduate degree (Masters, Ph.D.)
 - f. Prefer not to answer

13. What is your Gender?
 - a. Male
 - b. Female
 - c. Prefer not to answer

14. What is your Age?
 - a. 18-29
 - b. 30-39
 - c. 40-49
 - d. 50-59
 - e. 60-69
 - f. 70+
 - g. Prefer not to answer

15. What is your Race/Ethnicity? (Note: we are collecting this information to help determine the diversity of DOT agency's workforce)
 - a. White/Caucasian
 - b. African-American
 - c. Asian-American
 - d. Hispanic/Latino
 - e. Native American/Alaska Native

- f. Native Hawaiian/Pacific Islander
- g. Prefer not to answer
- h. Other (Please state): _____

16. Would you be available for a follow-up interview?

- a. Yes
- b. No

If yes, please provide your name and email/phone that you can be contacted at:

NAME: _____

Email/Phone: _____

Section 2 – Hiring, Retaining, and Promoting

17. Of the following choices, please select the **top three reasons** that attracted you to your position with your DOT agency when you were hired (Please select three).

Appealing job position	<input type="checkbox"/>
Competitive salary	<input type="checkbox"/>
Health benefits	<input type="checkbox"/>
Vacation/leave benefits	<input type="checkbox"/>
Retirement benefits	<input type="checkbox"/>
Promotion opportunities	<input type="checkbox"/>
Education benefits/tuition reimbursement	<input type="checkbox"/>
Professional development opportunities	<input type="checkbox"/>
Challenging work assignments	<input type="checkbox"/>
Lots of responsibilities	<input type="checkbox"/>
Stable employment	<input type="checkbox"/>
Diverse workforce	<input type="checkbox"/>
Desire to perform public service	<input type="checkbox"/>
State/government employment	<input type="checkbox"/>
Relative or friend already an employee	<input type="checkbox"/>
Other (Please state): _____	<input type="checkbox"/>

18. How likely are you to stay with your DOT agency until you are eligible to retire?

- a. Very likely
- b. Somewhat likely
- c. Neither likely or unlikely
- d. Somewhat unlikely
- e. Very unlikely
- f. Not sure

19. Of the following choices, please select your **top three reasons** that you think would improve the likelihood of you staying with your DOT agency until retirement (Please select three).

Salary opportunities/ Special compensation	<input type="checkbox"/>
Health benefits	<input type="checkbox"/>
Vacation/leave benefits	<input type="checkbox"/>
Working conditions	<input type="checkbox"/>
Promotion opportunities	<input type="checkbox"/>
Retirement benefits	<input type="checkbox"/>
Education benefits/tuition reimbursement	<input type="checkbox"/>
Flexible work schedule	<input type="checkbox"/>
Challenging work	<input type="checkbox"/>
Continued desire for public service	<input type="checkbox"/>
Work-life balance opportunities	<input type="checkbox"/>
More responsibilities	<input type="checkbox"/>
Diversity of the DOT workforce	<input type="checkbox"/>
Other (Please state): _____	<input type="checkbox"/>

20. How likely are you to leave your current position at your DOT agency for a position in the private sector within the next 5 years?

- a. Very likely
- b. Somewhat likely
- c. Neither likely or unlikely
- d. Somewhat unlikely
- e. Very unlikely
- f. Not sure

21. Of the following choices, please select your top three reasons that you think would make current DOT employees consider leaving for a private-sector position (Please select three).

Better salary opportunities	<input type="checkbox"/>
Better health benefits	<input type="checkbox"/>
More flexible vacation/leave benefits	<input type="checkbox"/>
Better vacation/leave benefits	<input type="checkbox"/>
Better working conditions	<input type="checkbox"/>
More promotion opportunities	<input type="checkbox"/>
Better retirement benefits	<input type="checkbox"/>
Better education benefits/tuition reimbursement	<input type="checkbox"/>
More flexible work schedule	<input type="checkbox"/>

Better salary opportunities	<input type="checkbox"/>
More challenging work	<input type="checkbox"/>
Improved work-life balance opportunities	<input type="checkbox"/>
More responsibilities	<input type="checkbox"/>
Less responsibilities for the same salary	<input type="checkbox"/>
Diversity of the private firm's workforce	<input type="checkbox"/>
Other (Please state): _____	<input type="checkbox"/>

22. Have you ever received any incentives (Bonuses, extra time off, recognition of high-quality work, etc.) from your DOT agency?

- a. Yes
- b. No
- c. Not sure

23. What incentives have you received from your DOT agency (Select all that apply)?

Annual bonus	<input type="checkbox"/>
Project bonus	<input type="checkbox"/>
Salary increase	<input type="checkbox"/>
Recognition for exceptional work	<input type="checkbox"/>
Education/Tuition reimbursement	<input type="checkbox"/>
Professional development	<input type="checkbox"/>
Relocation assistance	<input type="checkbox"/>
Reimbursement of professional registration dues	<input type="checkbox"/>
Work schedule flexibility	<input type="checkbox"/>
Leave/time off flexibility	<input type="checkbox"/>
Work-life balance	<input type="checkbox"/>
Bonus for recruiting other employees	<input type="checkbox"/>
Other (Please state): _____	<input type="checkbox"/>

24. What would you like to see your DOT agency do to make your agency a more desirable place to work? Please enter any comments you may have.

25. Does your DOT agency provide professional development opportunities?

- a. Yes
- b. No
- c. Not sure

26. If yes to question 23, what professional development opportunities have you experienced with your DOT agency (Select all that apply)?

Structured technical/skills training program	<input type="checkbox"/>
Structured management/leadership training program	<input type="checkbox"/>
Distance/Video conferencing learning	<input type="checkbox"/>
Online education/training courses	<input type="checkbox"/>
Internship	<input type="checkbox"/>
Rotation of position	<input type="checkbox"/>
On-the-job training	<input type="checkbox"/>
Skill development workshops	<input type="checkbox"/>
Mentoring program	<input type="checkbox"/>
Career development seminars	<input type="checkbox"/>
Roundtable discussions	<input type="checkbox"/>
Succession training	<input type="checkbox"/>
Other (Please state): _____	<input type="checkbox"/>

Section 3 – Perception of Your DOT Agency

27. My perception of my DOT agency was mostly positive before I was hired

- a. Strongly agree
- b. Agree
- c. Neither
- d. Disagree
- e. Strongly disagree

28. My perception of my DOT agency today is mostly positive

- a. Strongly agree
- b. Agree
- c. Neither
- d. Disagree
- e. Strongly disagree

29. I feel like I make a meaningful contribution to my DOT agency on a regular basis

- a. Strongly agree
- b. Agree
- c. Neither
- d. Disagree
- e. Strongly disagree

30. I feel like I make a meaningful contribution to my community/state

- a. Strongly agree

- b. Agree
 - c. Neither
 - d. Disagree
 - e. Strongly disagree
31. My work is highly valued by my supervisor and colleagues
- a. Strongly agree
 - b. Agree
 - c. Neither
 - d. Disagree
 - e. Strongly disagree
32. My work is highly valued by our stakeholders and traveling public
- a. Strongly agree
 - b. Agree
 - c. Neither
 - d. Disagree
 - e. Strongly disagree
33. I feel like I am a valued employee of my DOT agency
- a. Strongly agree
 - b. Agree
 - c. Neither
 - d. Disagree
 - e. Strongly disagree
34. Employees that are effective tend to receive incentives within my DOT agency
- a. Strongly agree
 - b. Agree
 - c. Neither
 - d. Disagree
 - e. Strongly disagree
35. Employees are able to be promoted based on performance within my DOT agency
- a. Strongly agree
 - b. Agree
 - c. Neither
 - d. Disagree
 - e. Strongly disagree
36. My DOT agency has provided me with professional development opportunities to advance my skills and knowledge in my career
- a. Strongly agree
 - b. Agree
 - c. Neither
 - d. Disagree
 - e. Strongly disagree

37. Morale of my DOT agency is high today

- a. Strongly agree
- b. Agree
- c. Neither
- d. Disagree
- e. Strongly disagree

38. Morale of my DOT agency is higher today than it was 1 year ago

- a. Strongly agree
- b. Agree
- c. Neither
- d. Disagree
- e. Strongly disagree
- f. Did not work for the DOT 1 year ago

39. Morale of my DOT agency is higher today than it was 5 years ago

- a. Strongly agree
- b. Agree
- c. Neither
- d. Disagree
- e. Strongly disagree
- f. Did not work for DOT 5 years ago

40. I am proud to be a state employee

- a. Strongly agree
- b. Agree
- c. Neither
- d. Disagree
- e. Strongly disagree

41. If I was offered a job opportunity at another firm/agency, I would choose to stay in my current role at my DOT agency

- a. Strongly agree
- b. Agree
- c. Neither
- d. Disagree
- e. Strongly disagree