



# **2nd Transportation Systems Management And Operations (TSMO) Summit**

---

## **White Paper: Attracting Non-Traditional Workers Into The TSMO Workforce**

AUTHOR  
Todd Szymkowski, PE, PTOE, PMP

January 2022

# White Paper Highlights

---

- There are many categories of non-traditional workers that could be attracted to the transportation systems management and operations (TSMO) industry.
- Transportation organizations could benefit from hiring non-traditional workers through higher retention rates.
- There are several examples of how transportation and non-transportation organizations are changing the culture of work and trying to attract non-traditional workers.
- A variety of strategies are provided as “starter” ideas for piloting methods for attracting non-traditional workers.

## Introduction

---

During the 2nd TSMO Workforce Summit, there was interest in exploring how to tap into non-traditional workers to broaden the pool of potential employees. Non-traditional workers are people who may not meet traditional education and experience job requirements education and experience. Additionally, non-traditional work candidates may have backgrounds in other fields, be career changers, be neurodiverse, have a non-violent criminal record, or are returning to the workforce. They may also be self-taught, having picked up knowledge, skills, and abilities (KSAs) through on-the-job experiences or self-guided study. Whether it's a stay-at-home parent, gig-economy worker, remote worker, or cognitively impaired person, there is an increasing need to grow the candidate pool for supporting the changing requirements to operate our nation's transportation infrastructure. In a recent study, 52% of state and local workers are considering changing jobs, retiring, and/or leaving the workforce entirely. (Mission Square Research Institute 2021). This White Paper highlights the range of potential non-traditional workers that can be targeted to support TSMO as a short-term job, or even a long-term career. A brief discussion on barriers to hiring non-traditional workers, and strategies for transportation agencies that are considering testing a pilot program that targets one of the defined groups is also included.

This paper was developed as part of NOCoE's strategic goal to advance the TSMO workforce. This topic area is being explored as a follow-up to NOCoE's 2021 TSMO Workforce Summit, a gathering of TSMO and HR professionals. The summit revealed the importance of focusing on strengthening pipelines, focusing on the paraprofessional workforce, and highlighting TSMO as a career of choice. NOCoE will continue to work with its partners around solutions for each of these areas while also developing and sharing resources to benefit practitioners.

# Defining The Range Of Potential Non-Traditional Workers

---

When it comes to defining non-traditional workers, there is a wide range in knowledge, skills, and abilities that would help an organization advance TSMO. This section starts to define the characteristics of the non-traditional workforce including potential size of the pool (if quantifiable) and the typical types of work each group could support.

## STAY-AT-HOME CAREGIVERS

- **Definition:** Stay-at-home caregivers are people that decide to step away from a full time job and can broadly be broken into two categories: 1) stay-at-home parents focused on raising children and 2) stay-at-home personal and companion care focused on providing support to aging adults, people with disabilities or special needs. Opportunities for stay-at-home caregivers are likely during evening or early morning when caregiving responsibilities may be transitioned to others in the household.
- **Potential Size of Pool:** As of January 2021, there were 13.9 million (10.1 million females and 3.8 million males) stay-at-home parents. (Heggest 2021) Stay-at-home personal and companion care are estimated at 53 million. (Weber-Raley 2020)
- **Types of TSMO Work:** Remote performance management processing and synthesis, research, non-critical software development, plans, specifications & estimate development.

## GIG-ECONOMY WORKERS

- **Definition:** The gig-economy is a labor market characterized by short-term, flexible jobs that businesses offer to freelancers and independent contractors as opposed to traditional, permanent full-time jobs. Businesses can save money on recruiting, benefits, and payroll expenses, while gig-economy workers benefit by being able to earn income from multiple sources with a flexible work schedule. Typically gig-economy workers leverage online services to respond to requests for services. From a demographics perspective, skilled gig workers are represented by younger workers and more likely to have an advanced degree.
- **Size of Pool:** In 2020, the size of the gig economy workforce was estimated at 59 million people that performed freelance work within the last 12 months. (Edelman Intelligence / Upwork, Inc. 2020)
- **Types of TSMO Work:** Creative services, short-term software development, website development, replicable systems integration, manual development, technical writing.

## GEOGRAPHICALLY REMOTE WORKERS

- **Definition:** The pandemic has forced transportation agencies to rethink remote work. With several years of remote work, predominantly with workers living and working close to the former office location, there is opportunity to rethink where people live and work. Why can't somebody live in the northern part of the country work for an agency in the south, especially if the office and residency are within the same time zone? This is an issue that public agencies will need to grapple with, especially if worker shortages persist. A survey done by Harvard with the U.S. Patent Office found that when

workers were allowed to work from anywhere, there was a 4.4% increase in output compared to when workers were simply allowed to work from home. (NearU 2021) It's easier for private businesses to allow for geographically remote work, while there is a perception state and local government workers should live in or near their jurisdiction. There may be cases where workers from other countries could also provide remote work services, subject to specific work rules (e.g., work visas).

- **Potential Size of Pool:** Unlimited, especially if international remote workers are considered a potential resource.
- **Types of TSMO Work:** Any type of work that can be performed remotely such as planning, design, software development, analytics, remote troubleshooting, etc.

## NEURODIVERSE WORKERS

- **Definition:** Neurodiverse workers include people with autism, dyspraxia (a neurologically based physical disorder), dyslexia, ADHD, social anxiety disorders, and other conditions. The reason to consider accommodating neurodiverse workers is that they have special skills in pattern recognition, memory, or mathematics. Traditionally, neurodiverse candidates struggle to fit the profiles sought by prospective employers. However, recently many large scientific companies have recognized the value of neurodiversity and have made accommodations to attract candidates. Silicon Valley companies have noticed a much higher retention rate for neurodiverse workers, especially in positions that traditionally have a high turnover. (Pisano 2017)
- **Potential Size of Pool:** There are approximately 6.5 million people categorized as neurodiverse.
- **Types of TSMO Work:** Performance analytics, systems acceptance testing, business process improvement.

## ENCORE WORKERS

- **Definition:** Encore workers are typically defined as people that have done well in their first career and are motivated by social impact and a sense of personal fulfillment rather than economic factors in the next chapter of their life. The second-career paths are often concentrated in healthcare, environmental justice, education, arts, and public service. Encore workers bring confidence, wisdom, and time-tested ways to solve common problems to an organization. (Duval 2017)
- **Potential Size of Pool:** It is estimated there are 9 million Americans from age 44 to 70 in encore careers and another 31 million Americans interested in a second, encore career. (Duval 2017)
- **Types of TSMO Work:** TMC supervision, Freeway Service Patrol supervision, TSMO Training, TSMO Program Management.

## SELF-TAUGHT IT WORKERS

- **Definition:** There are many IT workers that have started out at the ground level of an organization and have risen throughout its ranks without formal training. In recent surveys, it is estimated that about 1/3 of coders received education through schooling, 1/3 were completely self-taught, and 1/3 include a combination of school and self-teaching. (HackerRank 2018)

- **Potential Size of Pool:** With approximately 178,000 computer programmers nationwide per the latest numbers from the Bureau of Labor Statistics and 1/3 being self-taught, the talent pool is estimated at approximately 58,000.
- **Types of TSMO Work:** Software development, statistical programming, systems integration, systems acceptance testing, software specifications development.

## SECOND CHANCE WORKERS

- **Definition:** Second chance workers are categorized as people that have been incarcerated, have paid their debt to society, and are attempting to create stable, productive lives. There are many non-profit organizations that have been created to help bridge transitioning back into society. Transportation agencies could partner with the non-profits on job-training programs to fill high demand positions. Studies have shown higher retention rates for second chance workers.
- **Potential Size of Pool:** Approximately 70 million people have criminal records and on an average day there are approximately 450,000 people incarcerated for non-violent crimes.
- **Types of TSMO Work:** ITS field work, highway maintenance, ITS construction inspection, TMC Operations.

# Considerations For Hiring Non-Traditional Workers

---

## CURRENT BARRIERS

Transportation agencies, and government in general, have challenges adapting to models that allow for the hiring of non-traditional workers. Examples of the barriers include:

- **Trade and Professional Unions** – Collective bargaining agreements for trade and professional unions can limit creativity in hiring practices due to inherent governance and contract requirements.
- **Professional Services Hiring Regulations** - Most transportation agencies have requirements for hiring professional services where it's challenging for sole proprietorships to do direct work with the organization. Professional liability and other insurance requirements, lack of an audited overhead rate, and other work distribution percentages make it difficult.
- **Lack of Work Schedule Flexibility** – Most transportation agency jobs still require an 8-hour work day/ 40-hour work week. However, the pandemic has forced transportation agencies to rethink how work is performed with a hybrid workforce, where some workers report at an office daily, some work from home, or various combinations where visiting the office may be only required a couple days per week.
- **Hiring Criteria** – Many transportation agencies require degrees for hiring specific types of positions. Historically, to advance in a transportation agency, you needed to be licensed professional engineer, which required a bachelor's degree in engineering.
- **Long, Drawn Out Contracting Processes** – To secure professional or other types of services, transportation agencies are typically limited in the ways they can solicit and retain workers. There's typically a process for consultants which is capabilities-based, requests for proposals that combine cost

and qualifications, or request for bids which is solely based on cost. Non-traditional workers typically don't have the resources to handle the bureaucracy that goes along with contracting with government agencies.

## Changing The Culture Of Work

---

There are many ways culture is shifting to better accommodate non-traditional workers. Many transportation agencies have a culture of hiring seasonal workers for plowing and mowing activities, often using creative recruiting of non-traditional workers, especially in times of high employment. Hiring other types of non-traditional workers seems like a logical next step. Below are some examples of how the public and private sectors are making accommodations for and tapping into the non-traditional workforce:

- As a society, we are at a point of transition in recognizing stay-at-home caregivers and normalizing time gaps in resumes. One example of this is how LinkedIn provided features to categorize stay-at-home caregiving as a profession in 2021.
- The Michigan Department of Corrections has a program called Vocational Village. It is a skilled trades training program that provides a learning environment for prisoners who want to complete their career and technical education. Michigan DOT draws on the program to place people who earn a CDL to support roadway maintenance activities. (Michigan Department of Corrections 2022)
- Louisiana Department of Transportation & Development supports a successful employment program where they partner with Baton Rouge Community College (BRCC) and provide internship opportunities to students with autism. Jobs are tailored to student strengths and needs. Hiring managers are trained on working with special populations. They have a 2-way training program between BRCC and LDOT.
- Minnesota DOT (MnDOT) includes employee resource groups (ERGs) focused not only on providing support for the employees themselves, but also on helping the department achieve its mission in employee development, recruitment, retention, and outreach. MnDOT has ERGs for:
  - Employees of Black, African American, West Indian and African descent
  - Employees with disabilities
  - Indigenous employees
  - Lesbian, Gay, Bisexual, Transgender, Queer, Questioning and Allies (LGBTQA) employees
  - Asian employees
  - Autism spectrum awareness
  - Contributions of women in transportation
  - Active military members and veterans
  - Employees of Latino descent (Minnesota Department of Transportation 2022)
- New York City DOT has had success in attracting females into traditionally male-dominated positions by rethinking where to advertise. Across the board, the Department has increased female participation at all levels by advertising jobs at non-profits that target non-traditional employment for women. The organization also support an ERG called WE WIN, or Women Empowering Women in Non-Traditional Work. (Lewis 2021)

# Strategies For Testing The Hiring of Non-Traditional Workers

---

As many have attested, developing programs to target potential non-traditional workers takes time and resources. However, the payoff can lead to a more sustainable pipeline of workers including higher rates of retention. Strategies that transportation agencies can use to test hiring non-traditional workers to perform a range of TSMO-related activities include:

- Working with purchasing to define activities that would qualify as short-term work that could be advertised on a gig-economy platform (e.g., Upwork, Freelancer, etc.).
- Pilot a “blind” hiring program based on qualifications and skills in the hiring process by removing names, gender, school names, and work history. Blind hiring practices help lead organizations to be more diverse and inclusive.
- Establish a relationship with a non-profit organization that is focused on reintroducing people with criminal record back into the workforce. One option is to work with the organization to develop workers with non-disqualifying felonies to obtain a Commercial Driver’s license (CDL).
- Provide accommodations for recruiting, hiring, and mentoring neurodiverse workers. Research shows that organizations that create inclusive working environments where neurodiverse individuals can thrive, may be rewarded with as higher levels of team creativity, innovation and longer term retention.

# References

---

- Duval, John. 2017. "What Employers Need to Know about Encore Careers." Fuse Workforce Development. October 24. Accessed January 2022. <https://www.fuseworkforce.com/blog/what-employers-need-to-know-about-encore-careers>.
- EARN. 2020. "Neurodiversity Hiring Initiatives & Partnerships." Employee Assistance and Resource Network on Disability Inclusion. Accessed January 2022. <https://askearn.org/page/neurodiversity-hiring-initiatives-and-partnerships>.
- Edelman Intelligence / Upwork, Inc. 2020. Freelance Forward 2020. Upwork, Inc.
- Goins, Alexa. 2021. "How to Tap into Non-Traditional Talent Pools." Kenzie Academy. April 26. Accessed January 2022. <https://kenzie.snhu.edu/blog/how-to-tap-into-non-traditional-talent-pools/>.
- HackerRank. 2018. "Student Developer Report 2018." reserach.hackerrank.com. Accessed January 2022. <https://info.hackerrank.com/rs/487-WAY-049/images/HackerRank-Student-Developer-Report-2018.pdf>.
- Heggess, Mary, L. et al. 2021. Tracking Job Losses for Mothers of School-Age Children During a Health Crisis. March 3. <https://www.census.gov/library/stories/2021/03/moms-work-and-the-pandemic.html>.
- Lewis, Crystal. 2021. "DOT Paving Paths for Women In Traditionally Male Occupations." The Chief. December 22. Accessed January 2022. [https://thechiefleader.com/news/open\\_articles/dot-paving-paths-for-women-in-traditionally-male-occupations-free-story/article\\_ca570b68-6382-11ec-b5ee-77b63cfd2dbb.html](https://thechiefleader.com/news/open_articles/dot-paving-paths-for-women-in-traditionally-male-occupations-free-story/article_ca570b68-6382-11ec-b5ee-77b63cfd2dbb.html).
- Michigan Department of Corrections. 2022. Vocational Village. Accessed January 2022. [https://www.michigan.gov/corrections/0,4551,7-119-33218\\_75514---,00.html](https://www.michigan.gov/corrections/0,4551,7-119-33218_75514---,00.html).
- Minnesota Department of Transportation. 2022. Diversity and Inclusion Programs. Accessed January 2022. <https://www.dot.state.mn.us/diversity-inclusion/programs.html>.
- Mission Square Research Institute. 2021. "The Great Resignation and COVID 19: Impact on Public Sector Employment and How Employers Can Help." Mission Square Research Institute. December. Accessed January 2022. <https://slge.org/wp-content/uploads/2022/01/greatresignationinfographic.pdf>.
- NearU. 2021. "Busting the productivity myth behind flexible working." nearu.io. October 6. Accessed January 2022. <https://nearu.io/article/busting-the-productivity-myth-behind-flexible-working>.
- Pisano, Gary. 2017. "Neurodiversity as a Competitive Advantage." Harvard Business Review. May-June. Accessed 01 2021. <https://hbr.org/2017/05/neurodiversity-as-a-competitive-advantage>.
- Silicon Republic. 2021. "How Tech Companies Can Hire Neurodiverse Candidates." Silicon Republic. November 3. Accessed January 2022. <https://www.siliconrepublic.com/advice/hiring-neurodiverse-candidates>.
- Smith, John. 2018. "Governments Embracing the Gig Economy." CXC. May 30. Accessed January 2022. <https://www.cxcglobal.com/en-us/governments-embracing-the-gig-economy>.
- Taylor, Johnny C. 2018. "Tapping Talent Without Bias." Society for Human Resource Management. March 26. Accessed January 2022. <https://www.shrm.org/hr-today/news/hr-magazine/0418/pages/tapping-talent-without-bias.aspx>.
- Weber-Raley, Lisa. 2020. 2020 Report: Caregiving in the USA. National Alliance for Caregiving and AARP.