



## **Northeast Transportation Workforce Center** *Transportation Job Needs and Priorities Report,* *Phase 2*

# **Northeast Region Strategic Action Plans**

### **I. Introduction**

The Northeast Transportation Workforce Center (NETWC) is housed at the University of Vermont Transportation Research Center (UVM TRC). It has collaborated in this effort with the Center for Advanced Infrastructure and Transportation (CAIT). The NE region includes eleven states – Maine, New Hampshire, Massachusetts, Rhode Island, Vermont, Connecticut, New York, New Jersey, Delaware, Pennsylvania, and Maryland – and the District of Columbia. This covers 181,261 square miles of land, or 5% of the United States (which is approximately 3.8 million miles, in total). In contrast, it contains 15.96% of the U.S. population (Census, 2011). Within these twelve areas, the landscape of the transportation industry varies substantially. It has 4 of the top 25 U.S. cities in terms of population (New York, Philadelphia, Boston and Washington, D.C.), while also including two states, and the District of Columbia, out of seven states within the US that have populations that do not exceed 1,000,000 people (i.e., Delaware, Vermont, and the District of Columbia). The [full background report](#) is available on the NETWC web site.

The NETWC engages with partners and regional and national stakeholders to ensure the surface transportation system has a skilled workforce to design, operate, build, and maintain a 21<sup>st</sup> century transportation to best support the region and country's social and economic vitality.

### **II. Report Overview**

As the nation moves forward in the 21st century, many challenges face the transportation industry; changing skill sets for current employees, large numbers of workers heading towards retirement, and the technological innovations that are changing the face of transportation itself will invariably cause gaps in the workforce pipeline. In January 2015, the NETWC started a two-phase Transportation Job Needs and Priorities Research effort, which was designed to assess these challenges and address the transportation workforce needs in the region.

'[Phase 1](#)' of the Job Needs and Priorities assessment allowed the Northeast Center to identify priority jobs and set the stage for meaningful regional workforce discussions and initiatives. In the findings, a broad summary of the region's transportation workforce and industry is presented along with an analysis of Northeast labor market data. Combining stakeholder input with historic, current, and future occupational estimates for transportation occupations, Phase I also identified 14 regional priority occupations as target areas for future center workforce development efforts (see Exhibit 1).

<b>Exhibit 1: Northeast Priority Occupations as Identified through Phase 1</b>			
<b>SOC Code</b>	<b>SOC Occupation Title</b>	<b>Northeast Percent Change 2012-2022</b>	<b>National Percent Change 2012-2022</b>
11-3021	Computer and Information Systems Managers	15.1%	15.3%
17-2051	Civil Engineers	16.8%	19.7%
17-1022	Surveyors	6.0%	10.4%
19-3051	Urban and Regional Planners	6.1%	10.3%
17-3031	Surveying and Mapping Technicians	10.2%	13.5%
47-2073	Operating Engineers and Other Construction Equipment Operators	12.0%	18.9%
47-2152	Plumbers, Pipefitters, and Steamfitters	16.1%	21.3%
49-3031	Bus and Truck Mechanics, Diesel Engine Specialists	7.3%	8.7%
53-3032	Heavy and Tractor-trailer Drivers	11.1%	11.3%
47-2051	Cement Masons and Concrete Finishers	18.0%	29.1%
47-2061	Construction Laborers	15.4%	24.3%
51-4121	Welders, Cutters, Solderers, and Brazers	4.9%	5.8%
53-1031	First-line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators	7.6%	8.6%
43-3061	Procurement Clerk	4.4%	1.9%

In conducting further outreach and research with stakeholders nationally and around the region, assessing potential workforce programs and partnerships to address the workforce gaps identified in Phase 1, a set of possible strategic ‘action plans’ emerged that will serve as the impetus to move related workforce development initiatives forward. The NETWC’s five draft strategic action plans reflect the programs and impacts that the workforce center seeks to make on the transportation workforce and the various systems that support this community. These strategic plans include:

- Action Plan 1: Attracting Tomorrow’s Workforce Across the Northeast
- Action Plan 2: Transportation Career Paths – Critical Tools for the Future
- Action Plan 3: Promoting and Branding Transportation as a Green Career
- Action Plan 4: Implementing Succession Planning/KM to Increase Organizational Resilience
- Action Plan 5: Upskilling Transportation’s Current Workforce to Meet Emerging Challenges and Opportunities

As indicated, the actions align with NETWC’s mission, values, focus areas. We wish to thank the NETWC advisors and other stakeholders who have already contributed to crafting these strategies.

Once implemented, the five strategies will serve as the foundation by which the Center will assist stakeholders across the region in meeting their workforce development needs.

## Action Plan 1: Attracting Tomorrow's Workforce Across the Northeast

**Summary:** This strategy will attract new candidates, specifically through the strengthening and promotion of career entry education and awareness programs (e.g., summer institutes, targeted engagement events, and realistic job previews (RJPs)). NETWC will advance efforts designed to effectively engage various audiences such as state and local education program directors, teachers, counselors, colleges and graduate schools, professional associations, and non-traditional applicants (e.g., women, minorities, and veterans).

**Description:** This action plan includes four separate but interrelated workforce development approaches.

- First, to increase transportation career awareness among students in grades 6-12, a NETWC study group will examine outcomes of existing engagement and awareness raising activities to ground approaches to be advanced with evidence of success. NETWC will engage with transportation stakeholders that partner with schools across the region to create after-school or summer programs that explore transportation occupations. These programs typically include classroom time where students have the opportunity to learn about the transportation industry from various sources, as well as field trips to local transportation agencies. The NETWC's facilitation of this process can help to ensure a consistent and systemic means to communicate career opportunities in the industry to students through engagement events and programs.
- Second, NETWC will work with representative industry stakeholders to reach out to Career Technical Education (CTE) schools and programs as well as Science, Technology, Engineering, and Mathematics (STEM) initiatives to implement the adoption of transportation curriculum, certifications and career engagement activities (e.g., Transportation Career Days). These initiatives will be stimulated at the state Education and Labor Department levels, and will engage workforce investment boards and industry coordinated programs designed to promote transportation careers to high school students and non-traditional employees. The strategy seeks to captivate students at a time when their interests are expanding and they are beginning to plan for their careers. Efforts will also, through increased awareness, reduce or eliminate barriers non-traditional candidates may face in seeking careers in transportation. Specifically, NETWC will look to challenges, opportunities and skill sets aligned with its *focus areas, e.g.*, in moving to a non-petroleum fueled fleet and effective responses to climate change and adaptation.
- Third, NETWC will engage the National Career Pathways Network at the Center for Occupational Research and Development (CORD) to develop a Transportation Career



Pathway Leadership Certificate (<http://www.ncpn.info/cpl-workshop.php>) based on the pilot program under TEDPP at the University of Vermont. This process will provide professional development and interaction between educators and workforce development specialists, and will be designed to solidify a state-by-state and regional network of actively participating actors. It will serve as a template for other initiatives to encourage recognizable and transferable credentials for transportation workforce professionals.

- Lastly, to expose non-traditional employees and students in community colleges, four-year colleges, and graduate schools, NETWC and representative stakeholders will work with transportation organizations in the region to develop a virtual pre-employment realistic job preview (RJP) that interested candidates can complete before applying for a job. This will provide candidates with a candid preview of what the job entails by allowing them the opportunity to see what the job is like and participate in simulated job tasks and virtual career mentoring with transportation employees in different fields.

**Importance in the Northeast Region:** According to stakeholders across the Northeast Region, students lack interest and awareness of career opportunities in the transportation industry. The industry also lacks a solid pipeline or recruitment methodology for some priority occupations, such as Computer and Information Systems Managers. Additionally, key occupations such as Urban and Regional Planners have a small job market in the region. These challenges, along with the challenge of competing with private sector organizations, make it difficult for the transportation industry to attract employees in priority occupations. By introducing students to the industry and the opportunities available, agencies may be able to pique students' interests in transportation careers and develop a pipeline of talent. This is especially important given the large amount of employees that will retire in the next 5-10 years. These strategies can also be used in support of the NETWC's objective to attract non-traditional employees, such as women and veterans, who may be unaware of opportunities in the industry or perceive barriers to entry. Furthermore, these strategies can allow potential employees to gain an understanding of skills that are needed to advance effectively in various transportation occupations, incentivizing them to seek opportunities to gain and develop those skills through employment in the industry.

## Target Audiences



Most importantly the outreach effort will seek to engage representatives from a wide range of transportation employers and organized labor to be active agents in programs directed toward (1) the grades 6-12 audience, targeting state and local program directors (Education & Labor), teachers, and counselors; (2) community colleges, 4-year colleges, and graduate schools, through University Career Centers, cross-school STEM programs, green jobs initiatives, key Department Faculty, and professional associations with active student focused outreach efforts; and (3) through labor department and workforce boards as well as key interest groups. This action plan will also target potential employees of all ages from key targeted groups (e.g., disadvantaged youths, women, veterans).

## Expected Impact



- Increase awareness of transportation careers among workforce development practitioners in the region.
  - Facilitate greater understanding in the community of career entry education and awareness programs' services and missions, and awareness of the value the transportation organizations bring to the region.
  - New partnerships are established and solidified. NETWC is identified as the “go to” source for transportation workforce resources by employers, educators, and job seekers.
  - More students choose transportation related course work/education.
  - Develop a talent pipeline and increase ease of recruitment by employers.
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## Action Plan 2:

# Transportation Career Paths Critical Tools for the Future

**Summary:** This action plan will promote career advancement, skill development, and employee retention among industry employees through the development and promotion of career path guidance in critical transportation fields. NETWC will provide support for efforts to engage entry-level staff, mid-career staff, and senior leaders in transportation organizations.

**Description:** The NETWC will engage with representative industry stakeholders and transportation organizations in the Northeast Region to develop *structured employee development practices* that will prepare employees for advancement. Career paths demonstrate the possible ways that a career can progress and the different jobs an employee might consider as their career develops. Career paths are typically represented as a diagram showing the relationships between various roles in an industry and the possible paths for moving between them, both linearly and laterally. Supervisors then work with their employees to identify and achieve goals that will help employees move up the career path.



Such tools are used within companies/agencies for internal advancement as well as by educational institutions and workforce development organizations to articulate career advancement in a track that can demonstrate how key skills are applied in occupations that may bridge between different employers and even fields (e.g., public to private, transportation to public works). In addition to helping individuals understand how to navigate their career, such tools assist employers in creating entry portals for workers transitioning from other fields or institutions and building retention strategies for experienced workers.

By helping employees see the growth and development opportunities available, career paths can increase retention in transportation agencies, as well as improving job satisfaction, employee motivation, and employee commitment. To accomplish this, the NETWC will work with representative industry stakeholders and transportation organizations to identify specific occupations that would benefit from *developing career paths*, and develop guidance for organizations to be able to undertake this process independently. The NETWC and industry stakeholders will provide transportation organizations with a career path guide, including templates and example career paths. By using this guide to develop career paths, organizations can increase retention in key positions and attract new employees by marketing the career paths and advancement opportunities in the industry.

**Importance in the Northeast Region:** In interviews, stakeholders in the region expressed that it is difficult to retain employees in some key occupations, due unusual career trajectories and/or employees' lack of awareness regarding career development. This is especially true for STEM occupations, such as Civil Engineers. By developing career paths, transportation organizations in the Northeast can increase retention of employees by making clear the career trajectories and growth opportunities available within the organization, as well as within the field in the region. This will also help organizations overcome difficulties in maintaining the pipeline for key skill

trades occupations (e.g., Plumbers, Pipefitters, and Steamfitters), which stakeholders mentioned as a challenge in interviews.

## Target Audiences



This action plan is targeted toward staff who are seeking career guidance, to assist them in making training and skill development decisions. Target career stages include entry-level staff, mid-career staff, and Senior leaders.

## Expected Impact



- Decreased turnover across the region.
- Better prepared staff for leadership positions.
- Increased job satisfaction and organizational commitment among mid-career staff.
- Increased organizational ability to properly target training and developmental experience.
- More new entrants into transportation career pathways programs.
- Increase in skilled workforce, leading to greater responsiveness to organization's mission.

### Action Plan 3:

## Promoting and Branding Transportation as a Green Career

**Summary:** As the transportation industry moves to transition to non-petroleum fuels, address key climate change concerns, advance multi-modal options, expand transit and promote active transport there is a clear opportunity to promote career opportunities in the transportation industry that advance an environmental mission, attracting potential new employees who are interested in green careers. NETWC will advance efforts to rebrand transportation occupations, including marketing efforts (e.g., plans and products such as write-ups, flyers, digital/social media, etc.) that can be used and distributed region-wide to ensure a consistent image of the field, presented in a positive light with respect to environmental quality. The NETWC will work with stakeholders to create focused efforts in different modes or fields, and as possible, track how such efforts influence the sector's ability to attract an increased number of high quality and diverse candidates.

**Description:** A focus on environmental sustainability and consciousness has been increasing in the U.S. in recent years. The millennial workforce, in particular, is attracted by organizations that focus on their environmental and social successes, and identify these as places where they would like to work. Studies have also shown that millennials feel it is a priority to make the world a better place through their work and many feel this can be achieved through advancing social responsibility and an increased focus on being “green” in the workplace. Transportation is transitioning in ways that can position it as a green industry, focusing on strategies and technologies and the new skills and competencies that are needed to, for example, create a fleet based on non-petroleum fuels, provide transit options to reduce SOVs and congestion, design and implement maintenance and construction processes using more sustainable materials and exerting less impact on environmentally sensitive areas.



**Increasing the image of transportation as being green or environmentally conscious** can attract a wider range of job candidates to the industry dedicated to addressing future challenges in the field. The first step in this process is to create a “brand” for the transportation industry in the Northeast that focuses on the desired understanding of the industry. As such, information included in this action plan will guide the NETWC and Northeast transportation organizations through the process of rebranding and updating the image of transportation. Specifically, the NETWC will partner with organizations to invent and deploy the process and work to provide consistency in the message and shared understanding across organizations. The NETWC will work with transportation organizations to *create branding and marketing materials* that promote transportation as a green field and highlight career options that benefit the environment and the community. This process will need to include understanding the message that needs to be shared and the appropriate way to brand transportation in light of the environment. By supporting organizations through this process, the NETWC can ensure the brand and message



are also aligned with the NETWC's focus areas of climate change adaptation and alternative fuels. This will involve cooperation among the NETWC and its partners across the region to ensure a consistent message is shared, that it is reaching the right audiences, and that the desired impact of the new brand is achieved.

**Importance in the Northeast Region:** To best attract new talent into priority jobs in the Northeast, it is valuable to focus on promoting the industry as one that is green, environmentally friendly, and focuses on building up the local community. By implementing this plan, the public will gain a more positive view of the transportation industry. This can increase participation in the industry, improve the overall image, and improve the number and quality of applicants interested in the field. Furthermore, rebranding the industry and promoting priority jobs as “green jobs” will support the NETWC's focus areas in moving to a non-petroleum fueled fleet and effective responses to climate change and adaptation.

## Target Audiences



This action plan focuses on actions that transportation agencies/organizations, industry stakeholders, and other transportation leaders across the region can take to rebrand the transportation industry. These groups will be responsible for creating a branding message that will benefit the industry's image across the region. Ultimately, transportation organizations and stakeholders will be able to share this information with the general public, job seekers at all levels, and students in fields related to the NETWC priority jobs.

## Expected Impact



- More positive view of transportation and transportation jobs by the general public.
- Increased applicants and interest in the field.
- Opportunity to earn grants or funding for green energy or technology.
- Stimulating growth in the industry and expanding the market.
- NETWC identified nationally as a leader in transportation workforce development, especially in priority areas of alternative fuels and climate adaptation.

## Action Plan 4: Implementing Succession Planning/KM to Increase Organizational Resilience

**Summary:** This action plan will strive to retain employees and institutional knowledge through development and implementation of succession planning and knowledge management initiatives. These efforts should be designed to engage entry-level staff, mid-career staff, and senior leaders.

**Description:** The NETWC will engage with transportation organizations in the Northeast Region to *identify key positions and capacities* that will be particularly hard hit or lost in the near future due to retirements, transfers, and other means of attrition. The NETWC will support organizations in *developing training programs that focus on management and leadership issues*. Organizations can then implement these training programs to provide developmental opportunities for entry-level and mid-career employees to fill vacated leadership positions. This type of training can help employees who are interested in becoming leaders of the agency acquire the skills necessary for advancement and continued success.



Additionally, the NETWC will support organizations in *developing knowledge management programs or initiatives*, in order to capture the knowledge of senior employees who may retire within the next 10 years. This will allow a means to pass knowledge down to entry-level and mid-career employees. It will also ensure organizations retain vital institutional knowledge, and will prevent “reinventing the wheel.”

This action plan serves to guide the NETWC, representative industry stakeholders, and organizations in the region to develop succession planning and knowledge management efforts. To assist organizations through this process, the NETWC and industry stakeholders will provide organizations with succession planning and knowledge management guides and templates. Organizations can then use this guidance to develop and implement succession planning initiatives, and ensure both employees and knowledge are retained.

**Importance in the Northeast Region:** Stakeholders in interviews mentioned that employees in key occupations from skilled craft trades such as Cement Masons and Concrete Finishers, to Civil Engineers are crucial to building and repairing infrastructure and new transportation systems. Addressing the region’s critical infrastructure needs is highly dependent on a workforce with the necessary knowledge and skills, as well as understanding and experience with the existing infrastructure. Due to upcoming retirements and departing employees, transportation agencies in the Northeast Region may be at risk of losing vital institutional knowledge. By implementing workforce planning initiatives and a knowledge management system, agencies can retain and pass on necessary knowledge and skills. Entry-level and mid-career employees can then use this information to further their own professional development and advance along their career pathways as increasingly valuable assets to their organization.

## Target Audiences



This action plan is targeted toward agency leaders and aspiring entry-level and mid-career staff seeking to continue to grow in new roles in their organization. Knowledge management systems benefit workers at all levels in an organization.

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## Expected Impact



### **Expected Positive Outcomes of the Practice**

- Fewer senior leader position openings in the future and a shorter amount of time needed to fill these positions with strong, qualified candidates.
  - Greater continuity in leadership and seeing-through of the long-term vision of the agency.
  - Methodology for establishing retention and KM strategies at state DOT is established.
  - Increased retention, engagement, and organizational commitment.
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## Action Plan 5: Upskilling Transportation's Current Workforce to Meet Emerging Challenges and Opportunities

**Summary:** This strategy serves to develop a list of highly valuable emerging skills and competencies that extend across selected transportation occupations in the region, the current capacity of organizations to advance this professional development, and training materials/protocols that can be used to upskill current industry employees at all levels, increasing on the job effectiveness and career pathway opportunities.

**Description:** Given the constantly changing transportation industry and the environment it must respond to, there is often a need evaluate current employee skills and competencies to determine how best to maintain relevance to new industry or job requirements. As such, the NETWC will work with representative industry stakeholders and organizations to *identify new and emerging skills* that will be needed for various transportation occupations and how these differ from current staff skills and job requirements.



**Importance in the Northeast Region:** Priority transportation occupations were identified in the Northeast region to determine beneficial areas in which to invest resources into workforce development. For these various occupations, there is change expected in the region regarding how work needs to be done or the processes to obtain needed results. For example, procurement clerks were identified as a priority occupation because of changing requirements for grants and funding programs; as such these employees may need new skills to successfully perform their jobs. Similarly, with an increased focus on environmental considerations, changes are occurring in how various transportation work, such as the construction and maintenance of roads, occurs. By *updating the understanding of skill needs* for these occupations, and identifying best practices to support training current employees on newly needed skills, workers in the Northeast will be better prepared for their work. This benefits employees through their increased skills, organizations through having properly trained workers, and the transportation industry in the region by having a skilled workforce ready to address emerging challenges.

## Target Audiences



This action plan is designed to benefit transportation organizations across the region by ensuring a qualified workforce. Further, it will benefit early-, mid-, and late-career employees within the selected occupations by providing opportunities for skill development and training to enhance their careers and performance. It will benefit education and training organizations in planning for new curriculum and resources to align educational outcomes with employer needs.

## Expected Impact



- By conducting a needs analysis, organizations can have a true understanding of the types of skills that are necessary to perform on the job. With this information, they will be able to train employees in ways to be effective and improve performance in a changing transportation environment.
- A clear picture of employee skill needs will be identified, which will serve to train the current workforce as well as to identify qualified job candidates in the future.
- Training specific to transportation needs and objectives can be developed and provided to employees; this will prepare them for success within the industry.
- Staff satisfaction can increase when employees feel like their organization is investing in them and preparing them to be successful on the job.
- Education and training organizations will be better able to align their curriculum and competency models with employer needs.