

The Evolving Surface Transportation Operations and Maintenance Workforce: Challenges and Opportunities



AHD 15 Maintenance and Operations Personnel Committee
Transportation Research Board
August 18, 2016

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The surface transportation maintenance and operations workforce is rapidly changing due to increasing retirements, downsizing, difficulties recruiting and retaining qualified employees, shifting responsibilities, and expanding use of advanced technologies.

Presentations:

- Millennials and the Transportation Workforce
- Creating Opportunities for Women in the Transportation Workforce
- Language Diversity Challenges in the Emerging Transportation Workforce
- Linking Veterans Credentials to Transportation Job Qualifications
- The National Operations Center of Excellence
- Question and Answer

The Evolving Surface Transportation Operations and Maintenance Workforce: Challenges and Opportunities

Speakers:

- Susan Gallagher, Montana State University Western Transportation Institute
- Stephanie Ivey, University of Memphis
- Thomas O'Brien, California State University, Long Beach, Southwest Transportation Workforce Center
- LaShanda Dawkins, Metropolitan Atlanta Rapid Transit Authority
- Steve Lavrenz, National Operations Center of Excellence

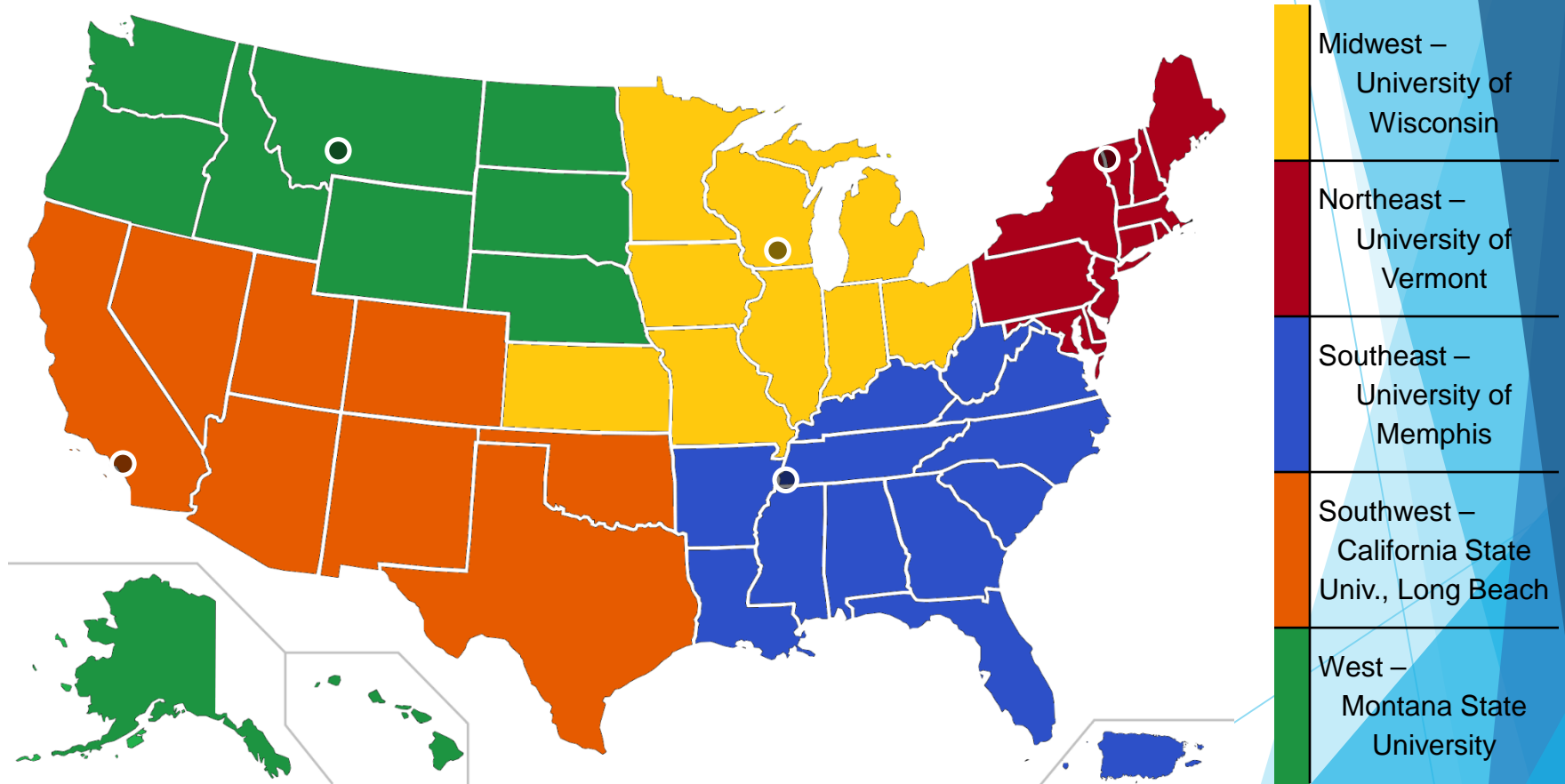
Moderated by: Dave Bergner, Monte Vista Associates, LLC; Chair AHD15



Millennials in the transportation workforce

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National Network for the Transportation Workforce



We don't understand this generation Y. It's a whole new mindset.

Millennials don't want to move and travel for work. They want to live where they want to be.

The work culture and rules at state DOTs are very foreign and different from how people now manage their daily lives.

The [DOT] is a very traditional workplace...Getting managers to think differently around how work is done with a millennial is really a culture shift.

We'd like to see some best practices, resources, and guidance on recruiting and engaging millennials.

Transportation Workforce

- ▶ Workforce hiring cycles => transportation workforce older than national average
 - ▶ 53% of transportation workforce over 45 years old
 - ▶ 35% of transit workers over 55 years old
- ▶ Growth & separations in industry => need for significant recruitment/hiring of new workers

Millennials

- ▶ Who are they?
 - ▶ Generation born between approximately 1983 and 2000
 - ▶ Other names: Generation Y, Generation Next, Generation Me
- ▶ Why do they matter?
 - ▶ Became the largest generational cohort in 2010
 - ▶ Quickly becoming largest generational cohort within the workforce as Baby Boomers retire
 - ▶ Generational preferences & characteristics have an impact on workplace culture & practices
 - ▶ HR professionals need tools to deal with rapid demographic shifts in workplace

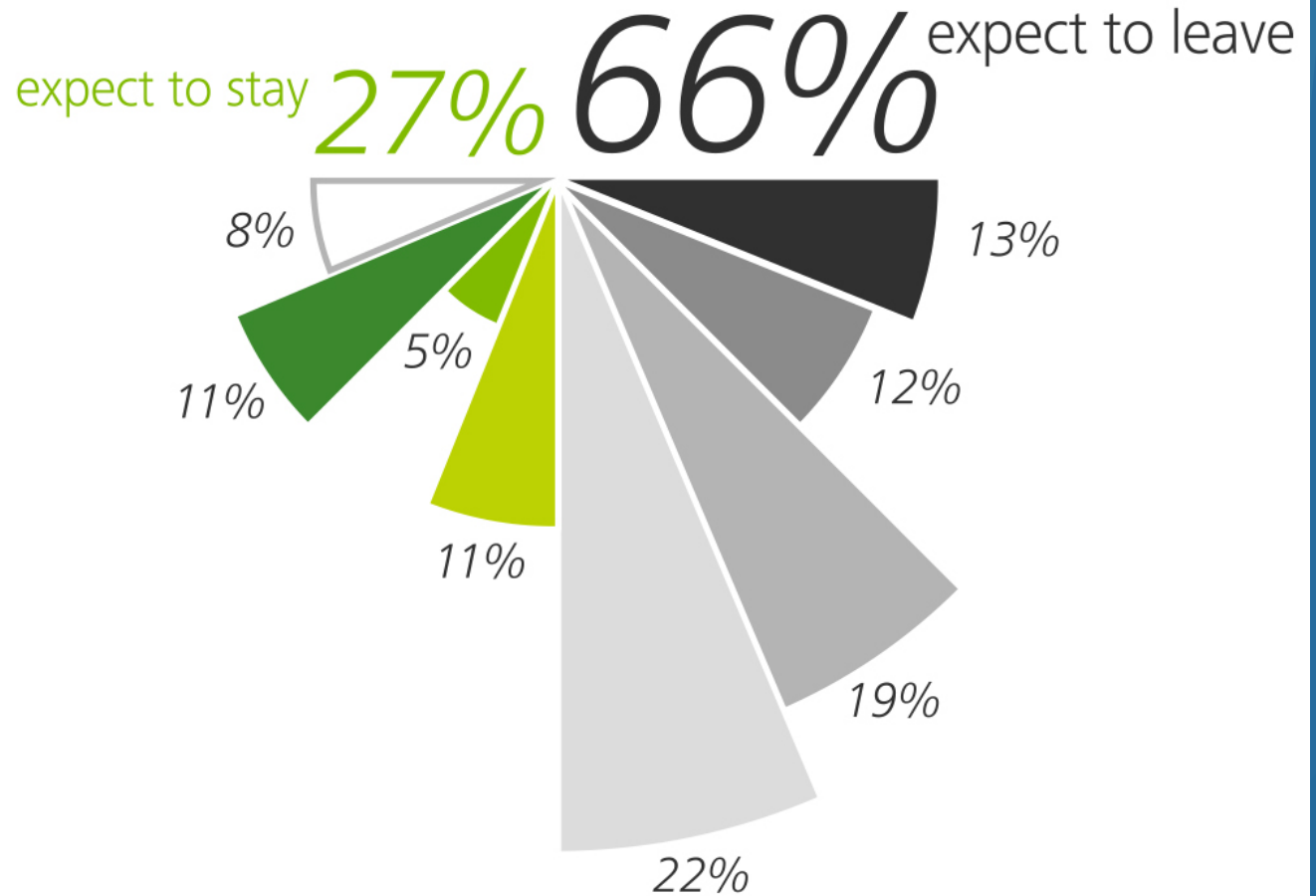
Purpose

- ▶ Better understand the current literature on Millennials in the workforce
- ▶ Better understand State DOT perspectives on hiring and retention issues

Methodology

- ▶ Literature Review
- ▶ Focus Group
 - ▶ Participants: HR professionals from Alaska, Minnesota, Montana, Wisconsin, and Oregon state DOTs

- ≤ 6 months
- 6 months to 1 year
- > 1 to 2 years
- > 2 to 5 years
- > 5 to 10 years
- > 10 years
- Would never leave
- Don't know



2 in 3 Millennials expect to leave by 2020

Deloitte Millennial Survey

<http://www2.deloitte.com/global/en/pages/about-deloitte/articles/gx-millennials-one-foot-out-the-door.html>

Managing & Motivating

- ▶ Creative performance rewards
- ▶ Engagement with challenging, meaningful tasks
- ▶ Results, not face-time at office focus
- ▶ Mentorship & Feedback!
- ▶ Providing opportunities for change

DOT Cultures of Engagement

Good response

- ▶ Professional & leadership development opportunities
- ▶ Involvement of young staff in improving agency processes/policies
- ▶ Performance recognition
- ▶ Mentorship & feedback

Shortcomings

- ▶ In-house mentorship capacity
- ▶ Hierarchical culture
- ▶ Sluggishness to change
- ▶ Expectations about where and when work should be done

Attraction

Positives

- ▶ Work/life balance
- ▶ Job security
- ▶ Professional development
- ▶ Job rotation programs
- ▶ Flexible schedules

Negatives

- ▶ Technology
- ▶ Image

Recommendations

- ▶ Consensus on need to:
 - ▶ Develop robust online and social media presence
 - ▶ Build in-house mentorship capacity
 - ▶ Improve public image of DOTs among young people
 - ▶ Develop career messaging that highlights attractive attributes
 - ▶ Conduct business process reviews
 - ▶ Review technology in the workplace
 - ▶ Develop evidence-based guidelines and tools

Questions?

Susan Gallagher, Project Manager
West Region Transportation Workforce Center
Western Transportation Institute, Montana State University
Email: sgallagher@montana.edu
wrtwc.org

Creating Opportunities for Women in the Transportation Workforce

Stephanie S. Ivey, PhD

Southeast Transportation Workforce Center

University of Memphis

www.memphis.edu/setwc

Presentation Overview

- Why is this important?
- Challenges
- Opportunities
- Where do we go from here?



Why is this important?

For the workforce:

- Impending retirements and pipeline challenges
- Women make up nearly 50% of the workforce, but only 2-20% of transportation occupations
- Increasingly complex problems require solutions from diverse perspectives
- Economic driver



Why is this important?

For women:

- Job opportunity and security
- Opportunity to bridge pay gaps
- Interesting and rewarding career pathways
- Transportation and societal impact



Challenges

- Lack of awareness
- Retention
 - Career pathways not understood (ladder)
 - Environment
 - Flexibility
- Perceptions
- Sponsors



Opportunities

- Changing conversation; early messaging
 - Early exposure
 - Mentors
 - **Career and Technical Education (CTE) – industry and higher education engagement**
 - Connect guidance counselors to resources
 - Parents!



Opportunities

- Men as champions
- Strategic partnerships
 - Education
 - Training
 - Internship/Apprenticeship
- Ultimately: Choosing Transportation



Where do we go from here?

- Changing the conversation
- Collaboration across the pipeline
 - K-12
 - Higher education
 - Industry
 - Community organizations
- Evaluation and Impact
 - APEC Women in Transportation Data Framework and Best Practices Report



Language Diversity Challenges in the Emerging Transportation Workforce

*The Evolving Surface Transportation Operations and Maintenance
Workforce: Challenges and Opportunities*

Dr. Thomas O'Brien
SWTWC Director, California State University Long Beach

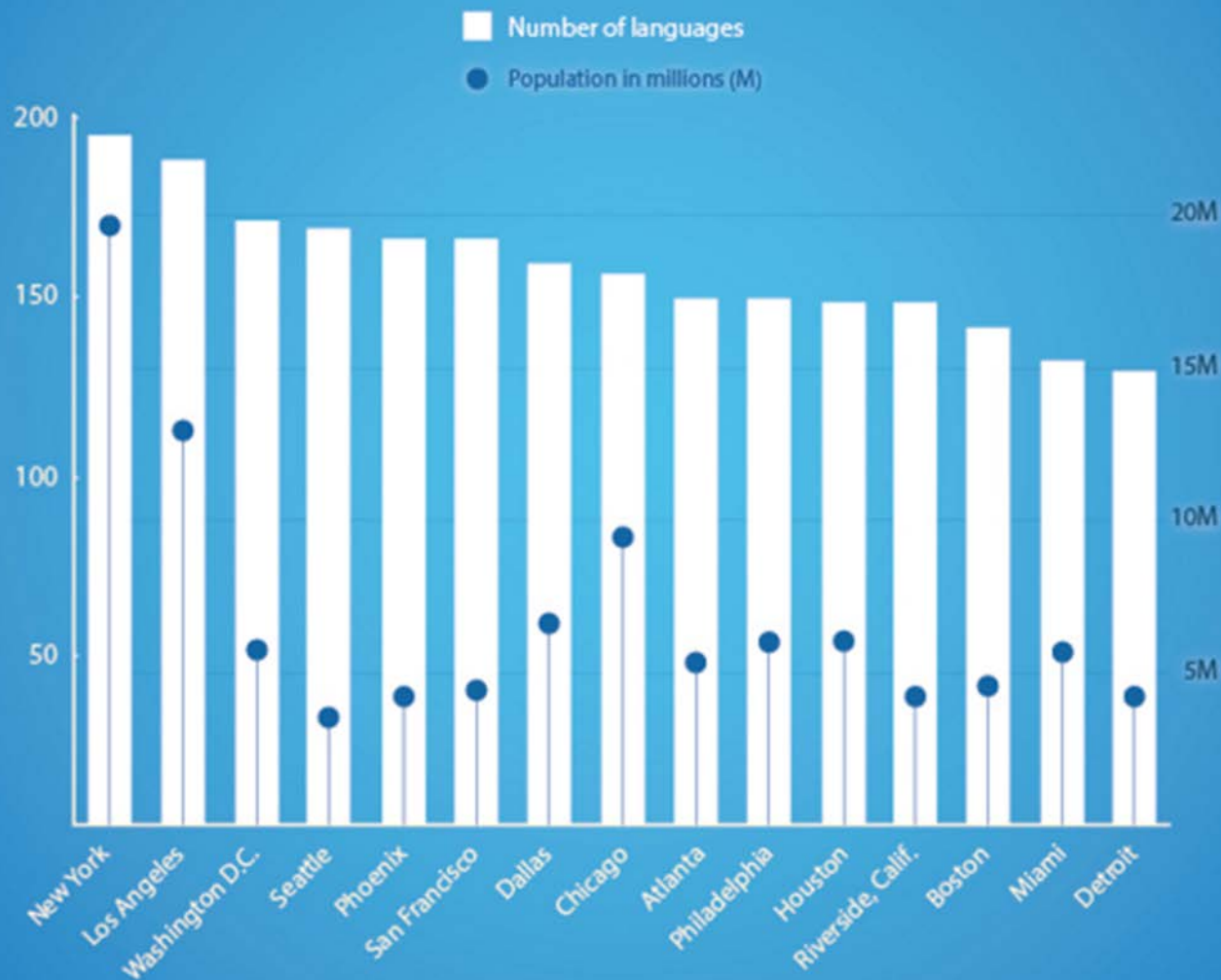
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Language Diversity

- America's foreign population has grown from just 10 million in 1970 to more than 42 million today.
- Roughly one-fifth of Americans speak a language other than English at home.
- Language acquisition education is a neglected field.
 - Demand far outstrips supply
 - Programs are underfunded
 - Many teachers have little training

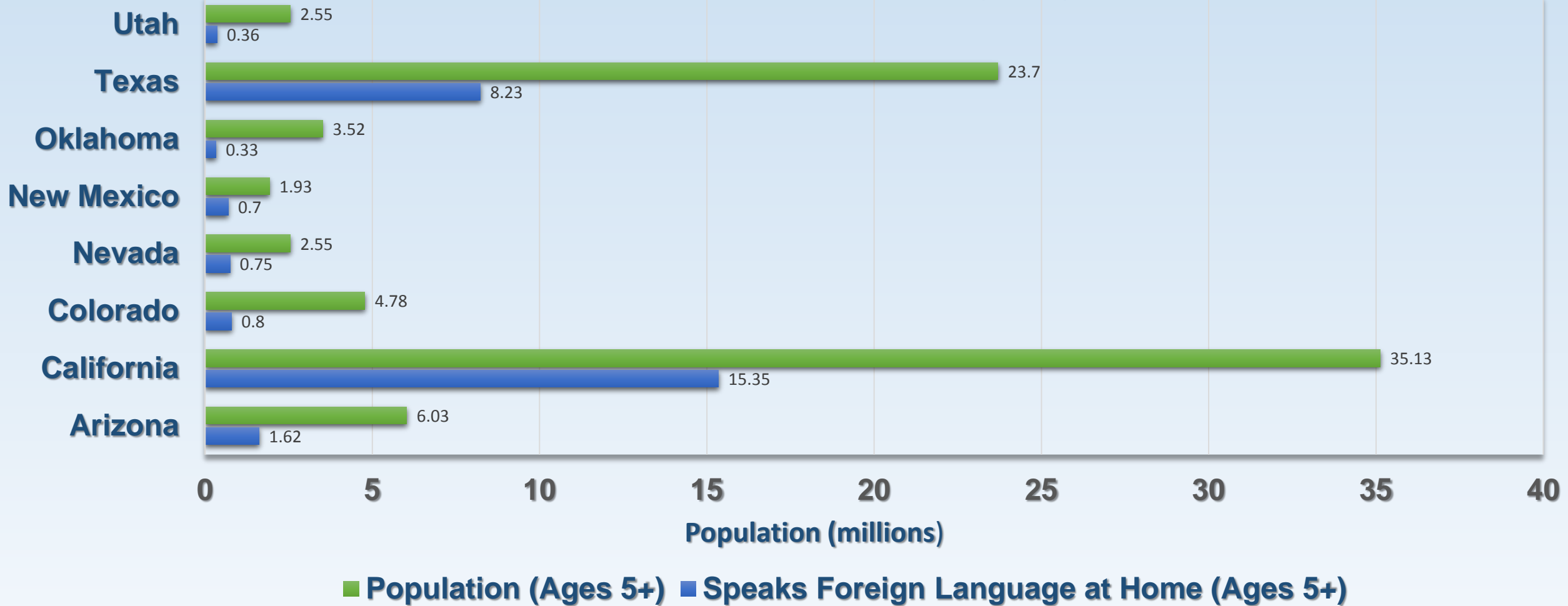
Jacoby, T. (2016). "Beyond survival English." LA Times

Number of Languages Spoken in the 15 Largest Metro Areas



Comparison of Foreign Language Speakers in the Southwest Region

(2009-2013 American Community Survey)



Key Maintenance and Operations Occupations in the Southwest

Occupation	Rationale
Operating Engineers and Other Construction Equipment Operators	<ul style="list-style-type: none"> • Growing need for heavy equipment operators • Increasingly wide variety of projects requires broader training
Bus and Truck Mechanics and Diesel Engine Specialists	<ul style="list-style-type: none"> • New technologies in terms of hybrids and alternative fuels • DOT needs diesel engine specialists for heavy equipment • One of the most difficult positions to fill overall
Traffic Technicians	<ul style="list-style-type: none"> • Growing need for employees familiar with ITS • Vital to the use and maintenance of new technology within the transportation industry

Note: From FHWA Job Needs and Priorities Report, Phase 1: Southwest Region, 2015

- Highway maintenance workers perform a broad range of tasks on roads and bridges in all weather and traffic conditions. In the performance of their duties they are exposed to a variety of challenges and hazards.
- These workers need appropriate knowledge, skills, and abilities to perform their activities effectively, thereby ensuring mobility and safety on the nation's highway system.
- Accordingly, suitable training and certification of maintenance workers is vital to their efficiency and safety.

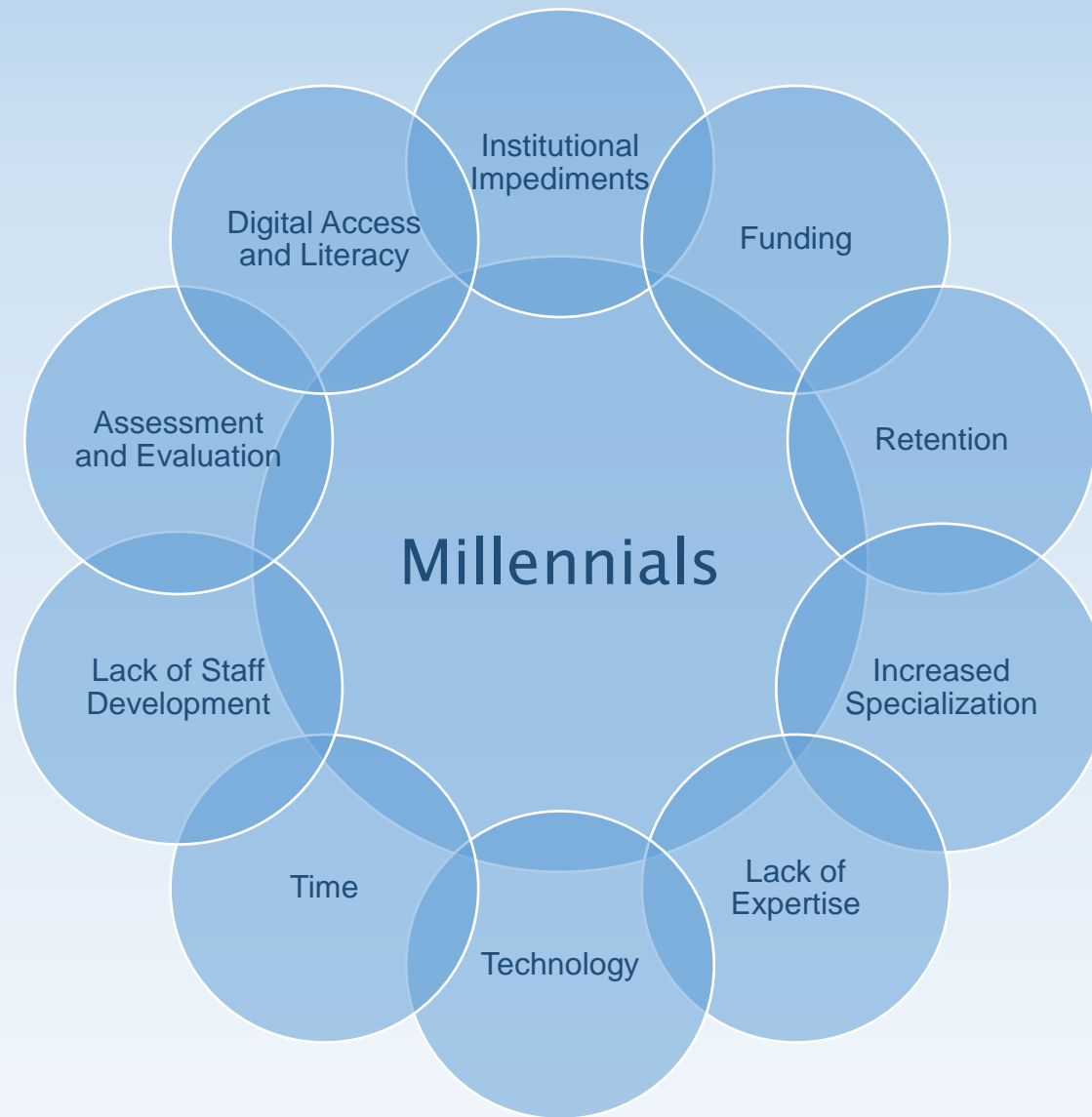
PUNCHLINE: WITHOUT SUFFICIENT LANGUAGE SKILLS, THESE BASELINE REQUIREMENTS BECOME NEARLY IMPOSSIBLE TO ATTAIN.

Occupational Data and Projections for Relevant Occupations in the Southwest Region

Occupations	Education	# of Employees			
Title	Needed for Entry	2012	Projected 2022	Change	Change (%)
Civil engineering technicians	Associate's degree	22,050	23,000	950	4.3
Electrical and electronics engineering technicians	Associate's degree	47,060	51,120	4,060	8.6
Highway maintenance workers	High school diploma or equivalent	19,970	22,430	2,460	12.3
Operating engineers and other construction equipment operators	High school diploma or equivalent	91,940	112,720	20,780	22.6
Rail-track laying and maintenance equipment operators	High school diploma or equivalent	2,290	2,600	310	13.5
Electrical and electronics installers and repairers, transportation equipment	Postsecondary non-degree award	3,750	4,210	460	12.3
Rail car repairers	High school diploma or equivalent	3,890	4,350	460	11.8

Note: From FHWA Job Needs and Priorities Report, Phase 1: Southwest Region, 2015





Millennials are increasingly likely to be foreign-born with a first language other than English.

- One in four of Millennials speak a language other than English at home
 - In New York, New Jersey, Texas, New Mexico, and Nevada, that proportion increases to one in three
 - In California, it increases again to one in two millennials
- As of 2013, the number of foreign-born people age 18 to 34 has increased 150% since 1980 (from 6% to 15%)

Note: From The American Community Survey by the US Census Bureau 2014

Addressing those challenges...

Collaboration between literacy program providers, businesses, and training programs

- Eliminate obstacles preventing federal and state funding for language modules in vocational training programs, e.g., digital access, staff development, experts in ESL, etc.

Active recruitment of millennials

- High-technology jobs, exciting opportunities, and better pay

Custom-designed Curriculum for ESL

- Effective programs have active involvement by employer, employee, and providers in training program planning and development

Incorporation of technology in curriculum and practice

- Training in use of technology in job tasks and contextual language learning to develop adult literacy and digital literacy in the workforce
- Increase motivation and adult literacy program retention

Integrating Technology and Computer Skills in ESL Programs

- Build on learners' strengths
- Build computer skills and language skills systematically
- Model technology and computer use
- Provide operations/maintenance context for language learning & computer skills development
- Increase technology skills through thematic instruction
- Assess technology and language skills separately
- Encourage experimentation and celebrate success

Note: from Learning for LIFE: An ESL Literacy Curriculum Framework (2011)

“Digital Literacy is Literacy”

- Give learners the ability to individualize their literacy needs
- Incorporate technology into learning programs to foster new literacy skills, contributing to enrollment and retention in adult literacy programs
- In a digital world, adults need to be capable of tasks beyond reading and writing; they need to be able to develop the skills, knowledge, and attitudes necessary to use technology to effectively and efficiently complete day-to-day tasks
- Don't assume that a generation raised on technology can use it on the job or to get a job

Instructional Innovations

- Worksite Instruction
 - Advantageous for employers and employees if more workplaces develop worksite English programs
 - Attend class onsite during paid-work time
 - Community resources – partner with local schools to provide onsite English instruction to employees
- Online & Mobile Training
 - Substantial cost savings and higher convenience
 - Reach greater number of students
 - Hybrid models for students with lower levels of English proficiency and digital literacy
 - Those without smartphones or internet connection, new platform: Cell-ED delivers English lessons through simple phone connection
 - Applications

Note: From Wilson, J. (2014) "Investing in English skills: The limited English proficient workforce in U.S. metropolitan areas" The Brookings Institution

SOUTHWEST TRANSPORTATION WORKFORCE CENTER

CENTER FOR INTERNATIONAL TRADE AND TRANSPORTATION (CITT)

AT CALIFORNIA STATE UNIVERSITY, LONG BEACH (CSULB)

1000 Studebaker Road, Suite 3 Long Beach, CA 90815

Director: Dr. Thomas O'Brien:

(562) 985-2875 | Thomas.OBrien@csulb.edu

Associate Director: Dr. Tyler Reeb

(562) 985-2879 | Tyler.Reeb@csulb.edu

<http://swtwc.org>

Making the Transportation Connection for Veterans



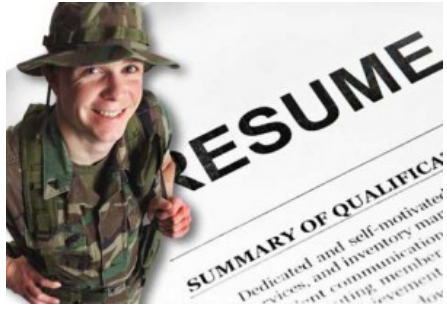
LaShanda R. Dawkins, Esq.
Acting Chief Administrative Officer
Metropolitan Atlanta Rapid Transit Authority (MARTA)

Understanding the Veteran

Veteran Concerns

- Where will I live?
- Where will I work?
- Will I be able to take care of my family?





Understanding the Veteran

Types of Veterans

- **Transitioning:** Six to twelve months (6-12 mos.)
- **Transitioned:** Up to 24 months from military service

Employer Toolkit



Hiring Veterans



*A Step-by-Step Toolkit
for Employers*



<http://www.americasheroesatwork.gov/forEmployers/HiringToolkit/>

Existing Workforce and Workforce Management

- The strategy must start with getting veterans to self-identify
- A comprehensive strategy should result in increased and accurate reporting of the workforce
- Take steps to encourage engagement in your workplace



Linking Veteran Experience to Transportation Careers

Federal agencies partner to promote careers in transportation

- Aviation Maintenance Technicians
- Air Traffic Controllers
- Commercial Motor Vehicle Drivers
- Rail Operations



Linking Veteran Experience to Transportation Careers

How your Rail Experience Translates

Military Experience:

Mechanic/Machinist

- Pipefitting
- Vehicle, Vessel & Aircraft Maintenance
- Welding & Metal Work

Career Opportunity:

- Locomotive Mechanic/Machinist (Diesel)
- Carman
- Roadway Mechanic
- Utility Worker
- Pier Mechanic/Machinist (Diesel)



Linking Veteran Experience to Transportation Careers

How your Rail Experience Translates

Military Experience:

Transportation

- Air Traffic Controller
- Battalion/Squadron level and higher operations NCOs & Officers
- Radio Telecommunication Operator (RTO)
- Transportation

Career Opportunity:

- Train Dispatcher
- Yardmaster
- Freight Conductor



Linking Veteran Experience to Transportation Careers

How your Rail Experience Translates

Military Experience:

Electrician

- Electronics Technician
- Electronic Troubleshooting and Maintenance

Career Opportunity:

- Locomotive Electrician (Diesel)
- Roadway Electrician
- Pier Technician
- Signal Worker (Maintenance)



Targeted Recruiting

- **My Next Move** for Veterans is an easy-to-use online tool created by the Department of Labor that allows veterans to enter information about their experience and skills in the field and match it with civilian careers that put that experience to use.
- **Veterans Recruiting Services** connects employers and veterans through virtual career fairs. VRS offers services to assist veterans and their spouses as they transition to the civilian workforce and helps employers find the right highly qualified, educated and well-trained veterans for their businesses.
- **The Veterans Job Bank** connects unemployed veterans to job openings with companies that want to hire them. The Obama Administration partnered with leading job search companies to create a new, easy-to-use online service that enables employers to “tag” job postings for veterans.



Veteran Resources

**U. S. Department of Labor's Veterans Employment and Training Service (VETS),
toll-free at 1-866-4-USA-DOL**

<https://www.whitehouse.gov/joiningforces/resources>

<http://www.vetsresource.org/>

<http://www.va.gov/ogc/docs/LegalServices.pdf>

**National Call Center for Homeless Veterans
1-877-4AID-VET (424-3838)**



Addressing the Workforce Needs of the TSMO Community

**Outcomes of the 2016 National Workforce
Development Summit**

Dr. Steven M. Lavrenz

Technical Services Manager, NOCoE

NOCoE's Inaugural Summit: TSMO Workforce Development

- Current State of the Industry
- Issues for the Summit to Address
- Summit Participants
- Emerging Strategic Direction
- Next Steps

Current State of the Industry

- Workforce capabilities a crucial component of realizing the potential of new ITS technology & TSMO applications
- NOCoE white papers developed in conjunction with a National Summit
 - Institutional context for TSMO in transportation agencies
 - Professional Capacity Building Needs vs. Available Resources
 - Recruitment, Retention and Career Development

Issues for the Summit to Address

Competencies, Education and Training:

1. Pre-employment education aimed at producing TSMO generalists
2. Pre-employment education aimed at producing key TSMO-related technical specialists
3. Position and qualifications specifications (KSAs)
4. Employment training programs

Recruitment, Retention and Career Development:

5. Keeping pace with emerging trends in technology/skills
6. Recruitment
7. Career development
8. Retaining top performers

Workforce Summit Participants

- Addressing diverse interests & perspectives
- 4 US DOT officials
- 11 state DOT officials
- 2 local agency officials
- 6 research & education representatives
- 4 private sector representatives
- 4 non-profit association representatives



An Emerging Strategic Direction

COMPETENCIES, EDUCATION AND TRAINING

Priority Action Item Implementation Strategies

1. *Pre-employment education for TSMO generalists and key support specialists.*
 - a. Forum of DOTs, private sector, and educators (2*)
 - b. Add existing programs and course materials into EKTS (1*)
 - c. Curriculum development for educational institutions & training programs (1*)
2. *Position and qualifications specifications (KSAs).*
 - a. Repository of similar existing PDs/KSAs; create model position descriptions based on position/function matrix established in previous research. (2*)
3. *Employment training programs.*
 - a. Review best practices for TSMO training policies (for new hires, promotions, and transfers); create model TSMO training programs (3*)

*** = Number of Actions Proposed**

An Emerging Strategic Direction

RECRUITMENT, RETENTION & CAREER DEVELOPMENT

Priority Action Item Implementation Strategies

4. *Recruitment*

- a. Document public/private entity best practices, including targeting non-CE disciplines and recruitment sources, recruitment “sweeteners” (e.g., signing bonuses). (2*)
- b. Develop a strategy to elevate TSMO visibility as a core transportation function (2*)

5. *Career development*

- a. Document best practices in mentoring, succession planning, cross training, special assignments, and individual career planning for public/private entities. (1*)

6. *Retaining top performers*

- a. Review current practices for rewarding performance (1*)

*** = Number of Actions Proposed**

Next Steps

- Board of Directors approval for strategic direction
- Assembly of strategic implementation team
- Upcoming newsletters and webinars will be used for outreach and engagement
- Meetings with partner and stakeholder groups to vet recommendations and roles
- NOCoE will facilitate the conversation and serve as a focal point for WFD resources

Contact Information

Website

www.transportationops.org

Managing Director

Patrick Son, PE

pson@transportationops.org

Technical Services Manager

Dr. Steven M. Lavrenz

slavrenz@transportationops.org