



The Future of TSMO Workforce:

New Approaches for Attracting and Retaining Talent

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UNIVERSITY OF MEMPHIS

MAY 16, 2019

AGENDA

- Brief overview of the National Transportation Career Pathways Initiative (NTCPI)
- Methodology and Operations priority occupations
- Key findings
- Career Pathway Models
- Implementation Plan
- Where do we go from here?



NNTW
National Network for the
Transportation Workforce



WEST

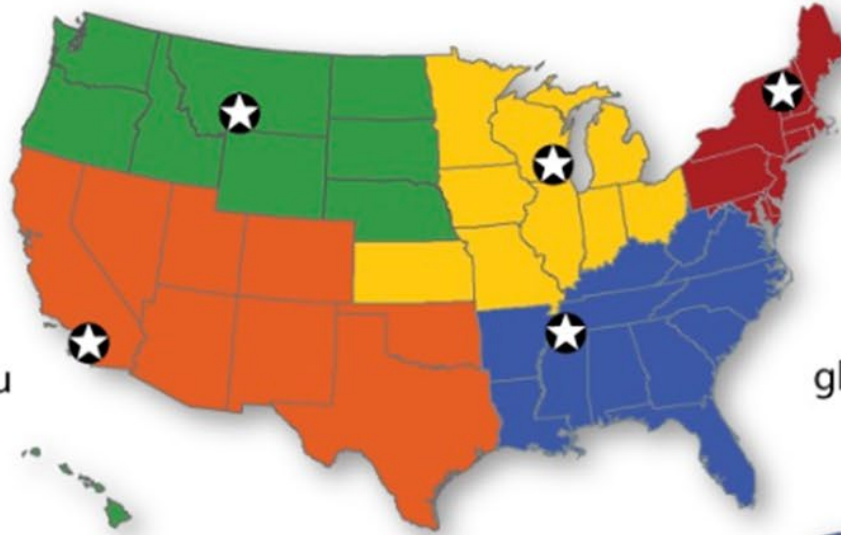
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National Transportation Career Pathways Initiative


PROJECT OVERVIEW

“A goal of the National Transportation Career Pathways Initiative is to document a series of career pathways (a sequence of educational courses and training programs that align to an occupational career ladder) that engage and prepare students for key transportation occupations.”



National Transportation Career Pathway Initiative

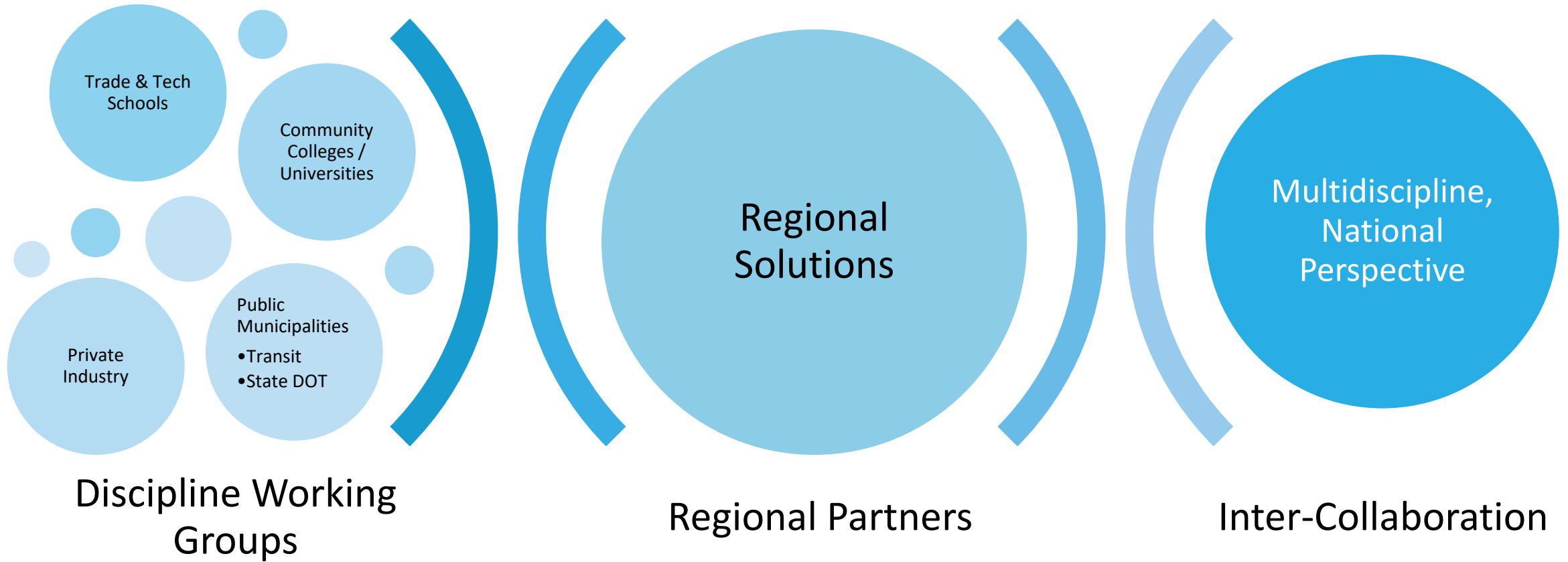
PROJECT OVERVIEW



*Inspire and prepare greater numbers of **students** to pursue transportation career pathways*

- *Identify Top 10-20 Occupations within each focus area in Transportation, Next 5-15 Yrs*
- *Identify Knowledge, Skills, Abilities (KSA's) Required by These Top Occupations*
- *Identify Gaps in Post-K12 Training/Education Delivery, Currently & Over Next 5-15 Yrs*
- *Identify Innovative Approaches to Delivering KSA's into Student/Worker Prep Pipeline*
- *Describe a Series of Career Pathways that Lead to Top Occupations, Next 5-15 Yrs*
- *Identify Scope of Pathway Implementation to Address Workforce Needs, Next 5-15 Yrs*
- *Identify Barriers; Propose Recommendations*

National Transportation Career Pathways Initiative



National Transportation Career Pathway Initiative

Unifying theme of disruptive technologies

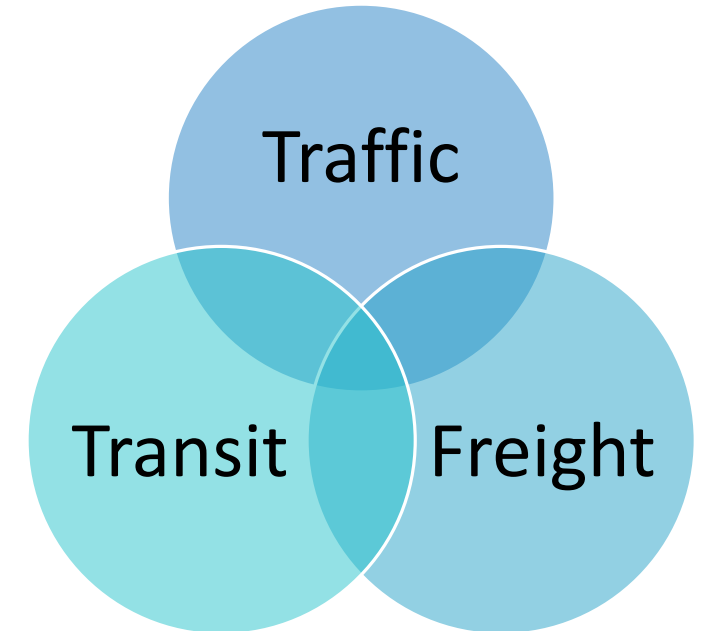
- CV/AV
- Robotics, Unmanned Aircraft Systems
- Big Data/Data Analytics
- Intelligent Transportation Systems
- Virtual & Augmented Reality
- Artificial Intelligence
- Shared Mobility
- Energy
- 3D Printing (Additive Manufacturing)
- IoT....and more!



National Transportation Career Pathways Initiative (NTCPI):

Operations Discipline

- Review of BLS data on Operations Occupations
- Discussions with Discipline Working Group
- Survey with operations stakeholders
- Literature review
- Analysis of online job postings and Burning Glass data
- Final discussion with DWG



Operations Discipline Priority Occupations

SOC CODE	OCCUPATION	CURRENT # EMPLOYEES, 2016	PROJECTED # EMPLOYEES, 2026	PERCENT CHANGE	2017 MEDIAN ANNUAL WAGE ¹
n/a	Project and Program Manager	n/a	n/a	n/a	n/a
11-3021	Computer & Information Sys. Mgrs.	367,600	411,400	11.90	\$139,220
n/a	Operations Planners	n/a	n/a	n/a	n/a
53-6041	Traffic Technicians (Traffic Signal / ITS Technicians)	6,600	7,200	9.10	\$45,670
n/a	Traffic Incident / Ops Center Mgrs.	n/a	n/a	n/a	n/a
17-2051	Civil Engineers (Traffic/Transit)	303,500	335,700	10.60	\$84,770
53-3032	Heavy and Tractor-Trailer Truck Drivers (Commercial Drivers)	1,871,700	1,980,100	6.00	\$42,480
53-3021	Bus Drivers, Transit or Inner-city (Commercial Drivers)	179,300	195,400	9%	\$40,780
49-3031	Diesel Service Technicians and Mechanics	278,800	304,600	9.00	\$46,360
13-1081	Logistician	148,700	159,000	6.90	\$74,590
17-2122	Industrial Engineer	257,900	283,000	10.00	\$85,880
15-2031	Operations Research Analyst	114,000	145,300	27%	\$81,390

¹U.S. Bureau of Labor Statistics Occupational Outlook Handbook, <https://www.bls.gov/ooh/>

NTCPI: Characterizing the Workforce

Common KSAs

Knowledge of Local Agency
Procedures
Knowledge of Transportation
Operations Practice
Communication Skills (both oral
and written)
Software/Software Skills
(specialized according to
occupation)
Problem Solving
Interpersonal Skills
Professional Judgement
Data Collection & Analysis
Ability to work in fast-paced
environment

Operations Management

- Project & Program Managers¹
- Computer & Information Systems Managers
- Traffic Incident Managers
- Operations Planners

Systems/Operations Engineering

- Civil (Traffic) Engineers
- Civil (Transit) Engineers
- Industrial Engineers²

Operations Research & Data Science

- Operations Research Analyst/Industrial Engineer
- Data Science Analyst/Logistician

Operations Technology

- Traffic Signal Technicians
- Diesel Mechanics
- Commercial Drivers

NTCPI: Characterizing the Workforce

Transportation operations as a discipline requires workers who are:

- Flexible, responsive and adaptive to an ever-changing set of technological tools and innovations,
- Capable of performing well under pressure and of making good decisions in high stress/high stakes environments;
- Effective communicators, particularly with a wide range of stakeholders,
- Knowledgeable of system infrastructure design and connectivity, and who
- Possess a range of skillsets related to data acquisition, management, analysis, modeling, and decision-making.

*The workforce of the future must possess more **interdisciplinary skills** that cross over traditional boundaries of academic preparation.*

NTCPI: Key Findings

- **EVERYONE** wants these professionals
- One of **most impacted discipline areas** in terms of disruptive technologies
- **Lack of awareness and misperception of operations occupations** are the most significant challenges
- As the complexity and interdisciplinary nature of operations jobs continues to increase, this further **complicates the career pathway model** and the mechanisms for introducing students to transportation operations careers in the traditional academic environment.

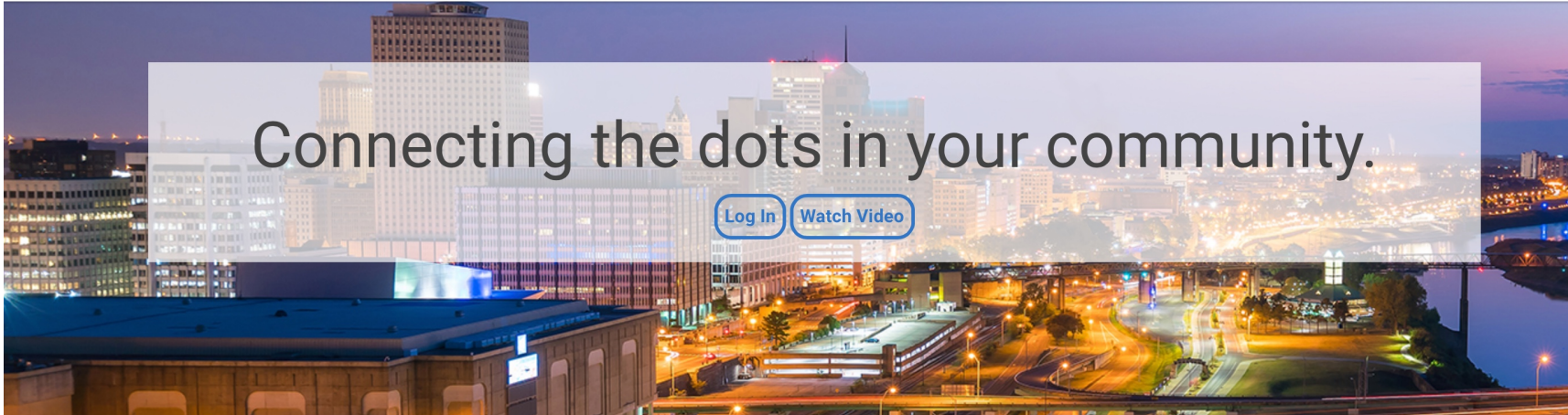
NTCPI: Key Findings

- **New mechanisms for providing learning experiences**, such as considering apprenticeships in non-traditional environments and occupations, novel industry-based training programs that do not require any ‘formal’ (traditional) education, and ‘bite-sized’ content delivery, will be necessary to increase awareness, adequately educate, and attract and retain workers in transportation operations.
- **Simulation-based training and virtual/augmented reality** provide promising new frontiers for increasing worker competency and improving training outcomes.
- **Facilitated discussion and role-playing** more effective than traditional lecture.
- Multiple learning styles means **multiple delivery methods**.

National Transportation Career Pathways Initiative: Operations Discipline

MEMPHIS
WORKS

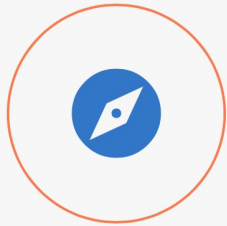
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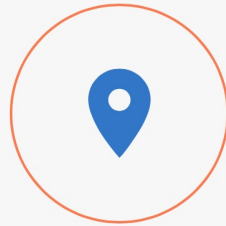
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How It Works



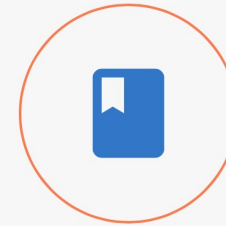
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National Transportation Career Pathways Initiative: Operations Discipline



ABOUT

STUDENTS

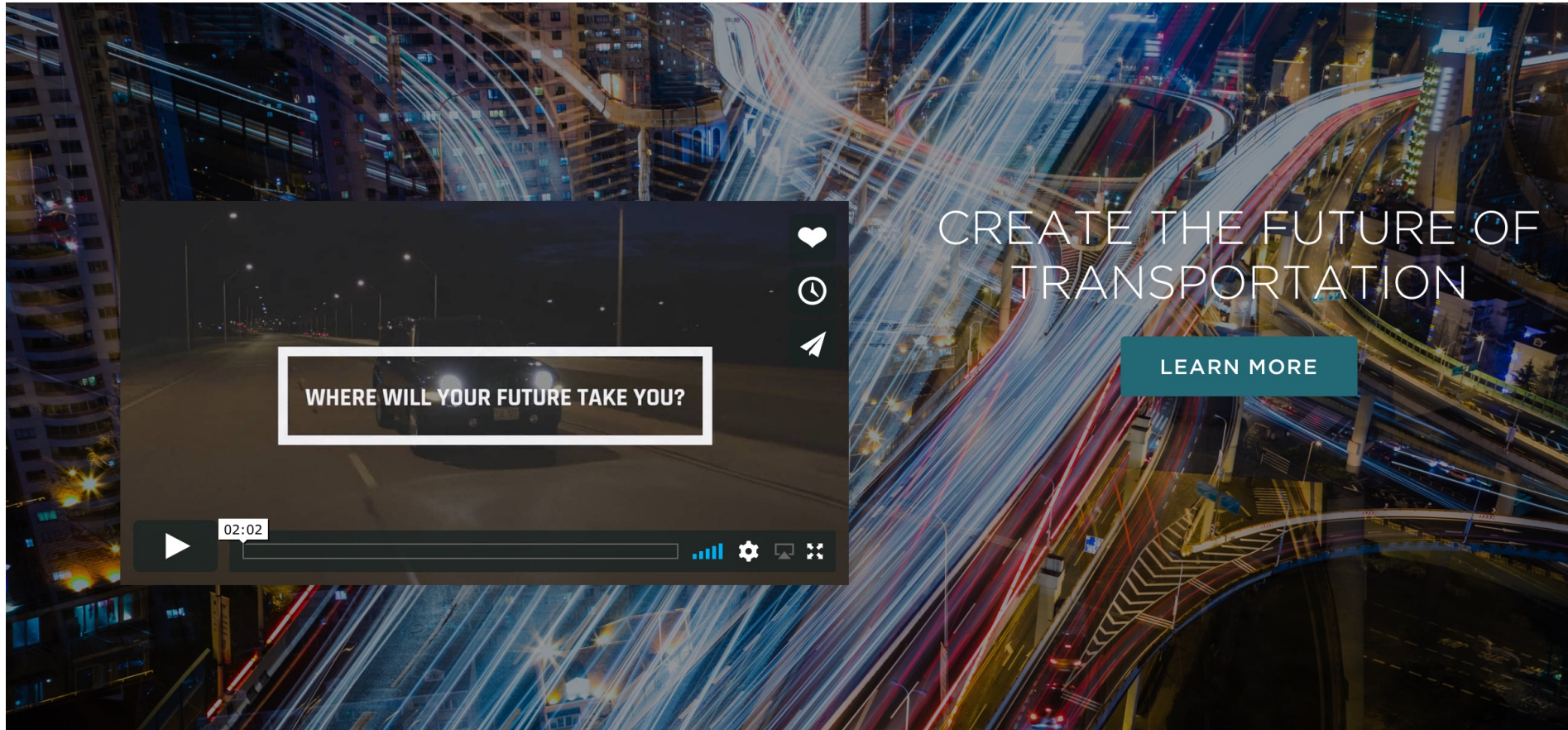
EDUCATORS

PROFESSIONALS

BLOG

SURVEY

JOBS



<http://transportationtech.com>



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Implementation Plan

- Interactive Transportation Operations Career Pathway Web Portal
 - Convene DWG to establish vision for web portal
 - Develop operations profile sheet
 - Develop interactive pathways for priority occupations within each career cluster with iterative feedback
 - Develop and deploy national marketing strategy
 - Track portal users and impact
- Transportation Operations Challenge Projects
 - Convene DWG to establish vision for Challenge Project development and deployment
 - Recruit participants and pilot test
 - Develop additional projects and deploy with expanded partnerships
 - Develop and deploy national marketing strategy
 - Track participants and impact

* National Transportation Career Pathways Initiative: Operations Discipline

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Transportation
Tuesday:
Spotlight on
Careers!



TRANSPORTATION SPOTLIGHT
PROFESSIONAL: KATIE BLOSE

NAME: Katie Blose
COMPANY: DBI Services, LLC
TITLE: Regional Safety & Compliance Manager

COLLEGE: Wilkes University
DEGREE: B.A. Criminology

Q: How did you select your certification program or college major?
A: I selected what classes interested me the most. I resolved that, if I studied what I was interested in, psychology, sociology, & criminal justice, that I would, and I did. I fell into a path I enjoyed after I finished school.

Q: What was the biggest influence in your selection of career pathway?
A: The biggest influence in selecting my career path was finding a difference and made me feel like I was making a difference and impacting this world positively. As a Safety Manager, I know that the trainings and advice I give to our teams have the potential to and do save lives.

Q: What attracted you to the transportation industry?
A: I was attracted to the transportation industry because of the ability to have an impact on creating safer roadways. Safer roadways mean a safer world for everyone.

Q: What is your favorite aspect of your job?
A: My absolute favorite aspect of my position is seeing our team members effectively deploying the trainings we provide to save lives. Most of our safety trainings translate to safety outside of the workday. I love getting a Saturday morning phone call stating that the Smith System Driving Class saved the lives of our employee and his family of 4 going to the grocery store or a field tournament to save a life alongside the highway. It is a special feeling to know that we are making a difference for our employees and their families and for the traveling public.

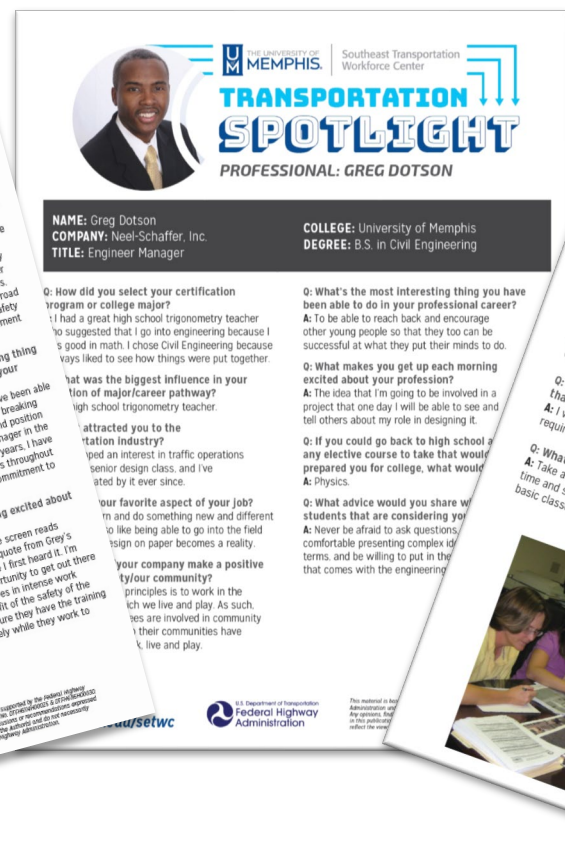
Q: How do you think your company makes a positive impact on society?
A: Our field teams are out there every day making a positive impact creating safer roadways and railways & saving lives. We are creating a safer world one road and rail at a time. My team, the Safety Team, is creating a safer environment for them to do that.

Q: What's the most interesting thing you have been able to do in your professional career?
A: The most interesting thing I have been able to do in my professional career is breaking through in a male dominated industry and position through in a male dominated industry and position as a young female & the first female Safety Manager in the US for DBI. Throughout the last two and a half years, I have acquired the respect and partnership of teams throughout every level of our organization through my commitment to the safety of our DBI family.

Q: What makes you get up each morning excited about your profession?
A: Every day when my alarm goes off, the screen reads "It's a beautiful day to save lives!" It's a quote from Grey's Anatomy that I've carried with me since I first heard it. I'm excited every day to be given the opportunity to get out there and save lives. Our guys put themselves in intense work environments every day for the benefit of the safety of the motoring public. It's up to me to ensure they have the training and equipment needed to work safely while they work to save lives.

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TRANSPORTATION SPOTLIGHT
PROFESSIONAL: GREG DOTSON

NAME: Greg Dotson
COMPANY: Noel-Schaffer, Inc.
TITLE: Engineer Manager

COLLEGE: University of Memphis
DEGREE: B.S. in Civil Engineering

Q: How did you select your certification program or college major?
A: I had a great high school trigonometry teacher who suggested that I go into engineering because I was good in math. I chose Civil Engineering because I always liked to see how things were put together.

Q: What was the biggest influence in your selection of major/career pathway?
A: I was attracted to the transportation industry by an interest in traffic operations senior design class, and I've stayed by it ever since.

Q: What is your favorite aspect of your job?
A: I like being able to go into the field and design on paper becomes a reality.

Q: How does your company make a positive impact on your community?
A: Principles is to work in the way we live and play. As such, we are involved in community projects that benefit their communities have a positive impact on how we live and play.

Q: What's the most interesting thing you have been able to do in your professional career?
A: To be able to reach back and encourage other young people so that they too can be successful at what they put their minds to do.

Q: What makes you get up each morning excited about your profession?
A: The idea that I'm going to be involved in a project that one day I will be able to see and tell others about my role in designing it.

Q: If you could go back to high school and select any elective course to take that would prepare you for college, what would it be?
A: Physics.

Q: What advice would you share with students that are considering your profession?
A: Never be afraid to ask questions, comfortably presenting complex ideas in terms, and be willing to put in the time that comes with the engineering profession.

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TRANSPORTATION SPOTLIGHT
PROFESSIONAL: CATALINA ECHEVERRI

Q: What makes you get up each morning excited about your profession?
A: It feels good to contribute to quality of people's lives. Traffic is something that we experience every day and we are constantly looking for ways to improve the transportation system.

Q: If you could go back to high school and select any elective course to take that would better prepare you for the future, what would it be?
A: I would recommend design and programming courses. Engineers have only one required course of each and those skills are always helpful after graduation.

Q: What advice would you share with K-12 students that are considering your profession?
A: Take as many science classes as possible. Most of the engineering majors have a hard time and sometimes drop out the first two years of math, physics, and chemistry. After the basic classes are done, you can concentrate on the engineering track chosen.

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NTCPI: Where do we go from here?

- It is essential for industry partners to be at the table with academia from the outset in considering how to prepare the operations workforce of the future.
- The **key disrupter** for transportation operations is not necessarily technology—rather, it is the **‘big data’** generated by new technologies and the need for workers skilled in data manipulation, analysis, and interpretation.
- For the operations workforce of the future, there is **no single college major or training pathway** that provides a **‘silver bullet’**. Academia and industry must partner to rethink the traditional education and training model and to look for ways to develop more relevant interdisciplinary learning experiences.

NTCPI: Where do we go from here?

- Flexibility and resilience
- Starting (or changing) the conversation
- **Collaboration across the pipeline!**

National Transportation Career Pathways Initiative: Operations Discipline

Questions?

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