The Future of TSMO Workforce:

New Approaches for Attracting and Retaining Talent

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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?
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

- 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

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

Regional Solutions

Inter-Collaboration

Multidiscipline, National Perspective

Discipline Working Groups

Trade & Tech Schools

Community Colleges / Universities

Public Municipalities
  • Transit
  • State DOT

Private Industry
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

<table>
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<tr>
<th>SOC CODE</th>
<th>OCCUPATION</th>
<th>CURRENT # EMPLOYEES, 2016</th>
<th>PROJECTED # EMPLOYEES, 2026</th>
<th>PRECENT CHANGE</th>
<th>2017 MEDIAN ANNUAL WAGE$1</th>
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<tr>
<td>n/a</td>
<td>Project and Program Manager</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
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<td>11-3021</td>
<td>Computer &amp; Information Sys. Mgrs.</td>
<td>367,600</td>
<td>411,400</td>
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<td>Operations Planners</td>
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<td>53-6041</td>
<td>Traffic Technicians (Traffic Signal / ITS Technicians)</td>
<td>6,600</td>
<td>7,200</td>
<td>9.10</td>
<td>$45,670</td>
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<td>n/a</td>
<td>Traffic Incident / Ops Center Mgrs.</td>
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<td>17-2051</td>
<td>Civil Engineers (Traffic/Transit)</td>
<td>303,500</td>
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<td>10.60</td>
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<td>53-3032</td>
<td>Heavy and Tractor-Trailer Truck Drivers (Commercial Drivers)</td>
<td>1,871,700</td>
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<td>6.00</td>
<td>$42,480</td>
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<td>53-3021</td>
<td>Bus Drivers, Transit or Inner-city (Commercial Drivers)</td>
<td>179,300</td>
<td>195,400</td>
<td>9%</td>
<td>$40,780</td>
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<td>49-3031</td>
<td>Diesel Service Technicians and Mechanics</td>
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<td>13-1081</td>
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<td>$74,590</td>
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<td>17-2122</td>
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<td>10.00</td>
<td>$85,880</td>
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<td>15-2031</td>
<td>Operations Research Analyst</td>
<td>114,000</td>
<td>145,300</td>
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**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 Managers
- Computer & Information Systems Managers
- Traffic Incident Managers
- Operations Planners

**Systems/Operations Engineering**
- Civil (Traffic) Engineers
- Civil (Transit) Engineers
- Industrial Engineers

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

**Operations Technology**
- Traffic Signal Technicians
- Diesel Mechanics
- Commercial Drivers

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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

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http://transportationtech.com
Career Pathway Model Templates

- Academic ladder aligns with career ladder.
- Graphic illustrates multiple entry/exit points.
- Career ladder connects to jobs specifications.
- Full 6-year prescriptive student academic plan.
- Experiential learning programs and innovative learning strategies are fully enumerated.
- Simplified approach engages multiple audiences.
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

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Transportation Tuesday: Spotlight on Careers!
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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