



***TRB Standing Committee on Education and Training
National Network for the Transportation Workforce
APTA Workforce Development Committee***

***Advanced Technologies and the Impact on
Transportation Industries:
A Workforce Conversation***

Monday, December 18, 2017

2:00 – 3:15 p.m. Eastern Time

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Session Moderator and Presenter



Mr. Ferdinand Risco

**Assistant Executive Director, TARC;
Vice Chair, Workforce Development
Committee**

A Partnership Webinar



- **TRB Standing Committee on Education & Training**
- **National Network for the Transportation Workforce**
- **APTA Workforce Development Committee**

Today's Presenters



Mr. Ferdinand Risco



Dr. Tom O'Brien



Ms. Leticia Barajas



Mr. Mike Loehr



Ms. Joanne Peterson




What to Expect ...

- **Topic overview**
- **Industry and Academic Presentations**
- **Panel Member Dialogue**
- **Audience Q&A and discussions**
- **Wrap up**



Asking audience questions

To submit a question or comment to the moderator during the session or during the Q&A, please type it into the **Question** box on your screen and then click on the send arrow located at the bottom of the box. 



The Changing Landscape:

**Identifying, Adapting, and
Predicting the Impacts of
Advanced Technologies on Our
Industry**

What We Already Know



- Technology continues to advance at increasingly fast rates
- It can have an adverse effect on the workforce and the industry
- We must identify current and future tech related issues
- Advanced tech creates challenges, and opportunities

Adaptation



- Organizations and agencies are recognizing the evolving workplace
- The industry must constantly train and prepare its workforce
- To keep up with challenges, organizations need to invest in the continual development of its workers and staff
- Diffuse industry silos

What the Future Holds



- How can we predict the challenges of the future?
 - By examining current trends
 - How are services, customer relations, and employee needs being influenced in real time?
 - staying ahead of the tech curve
 - Engaging the younger generation
 - Employing individuals who have the technical knowledge and skills to succeed



Session Presenter



Dr. Tomas O'Brien

Executive Director of the Center for International Trade and Transportation (CITT) at California State University, Long Beach; Associate Director of METRANS; Director, Southwest Transportation Workforce Center



Transformational Technology:

Connecting Research to Transportation Career Pathways

What is Transformational Technology?

- Understanding the difference between “disruptive,” “transformational,” and “advanced”

Transportation Research Board’s *e-Circular* identifies the latest transformational technologies:

- Connected/Automated vehicles
- Drones
- Internet of Things
- and Cybersecurity



Transformational Technology and Career Pathway Research

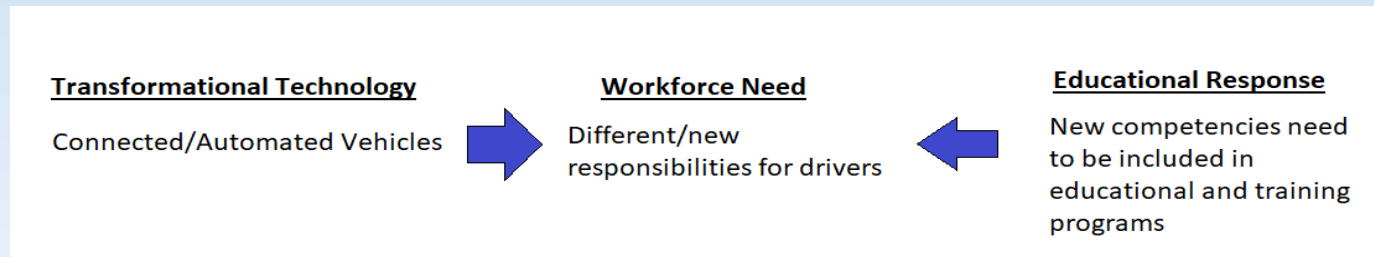
- How will transformational technology impact the transportation workforce and related education and training programs?
- How can research help inform the development of career pathways in response to the rapid changes caused by transformational technology?



Trucking Presentation for AGL

Transportation Career Pathway Research Findings

- SWTWC conducted a comprehensive literature review to determine the specific impacts of transformational technologies on the transportation workforce.

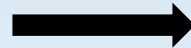


- The SWTWC research team conducted a related curriculum scan of bachelor's degree programs focused on transportation planning offered at universities in Southern California and noted a skills gap. Four-year programs included more theoretical knowledge and less applied technology and skills.

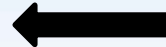
Sample Transportation Career Pathway Research Findings

Transformational Technology:

Shared Mobility: smartphones, on-demand services (Uber, Lyft), e-construction



What are the educational responses?



Impacts on Transportation Industry:

-Real-time updates affecting traveler's decisions for how, when, where to travel.

-E-construction allows managers to monitor inspectors' work and help track submittal approvals for timely project completion, contract compliance, and project safety.

-Demand-Responsive bus services could explore new routes that have uncertain demand.

-Ability for independent drivers to deliver meals and packages for businesses and consumers. Freight brokerage firms are using these platforms to match shipment with drivers.

Transit Occupations Impacted by Transformational Technologies

- The following are occupations that will be greatly impacted by technological innovations in the industry based on SWTWC's research:
 - Data Analyst
 - Tech Support Specialist
 - Transportation Managers
 - Transportation Operators
 - Transportation Maintenance
 - Programmers
 - Transportation Planners

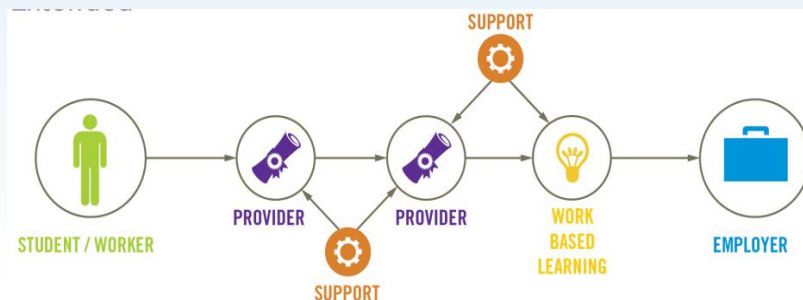
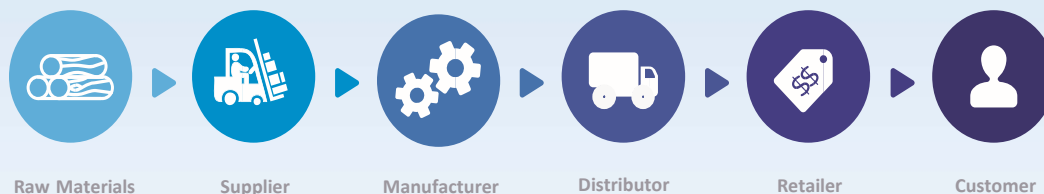
How can career pathway initiatives address skills gaps created by transformational technologies?

- Create a community of practice and build a two-way exchange of meaningful knowledge that:
 - I) Identifies Skills Gaps
 - II) Develops new transportation competency models
 - III) Commits to consistent communication between industry and educational leaders



Moving to a Supply Chain Approach

- Employers can close the skills gap by applying lessons learned from supply chain management (SCM) when partnering with education and workforce partners.



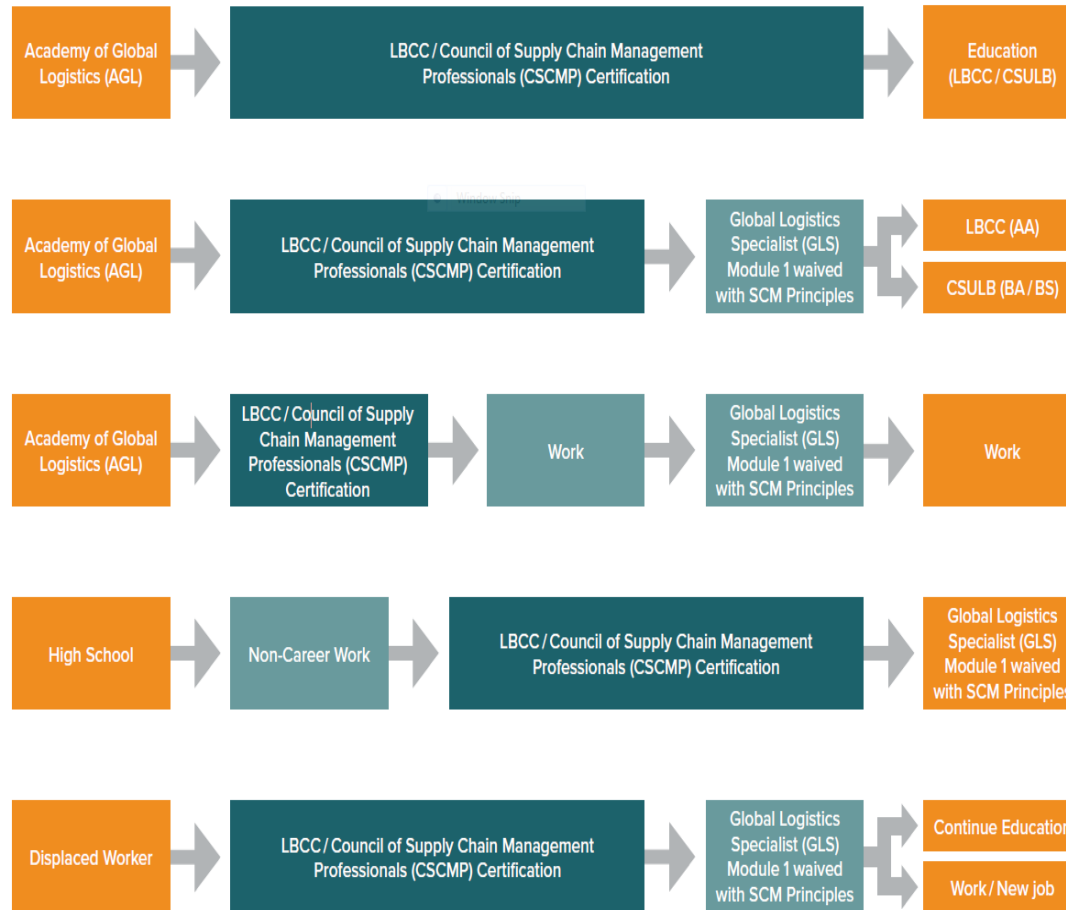
What is supply-chain thinking?

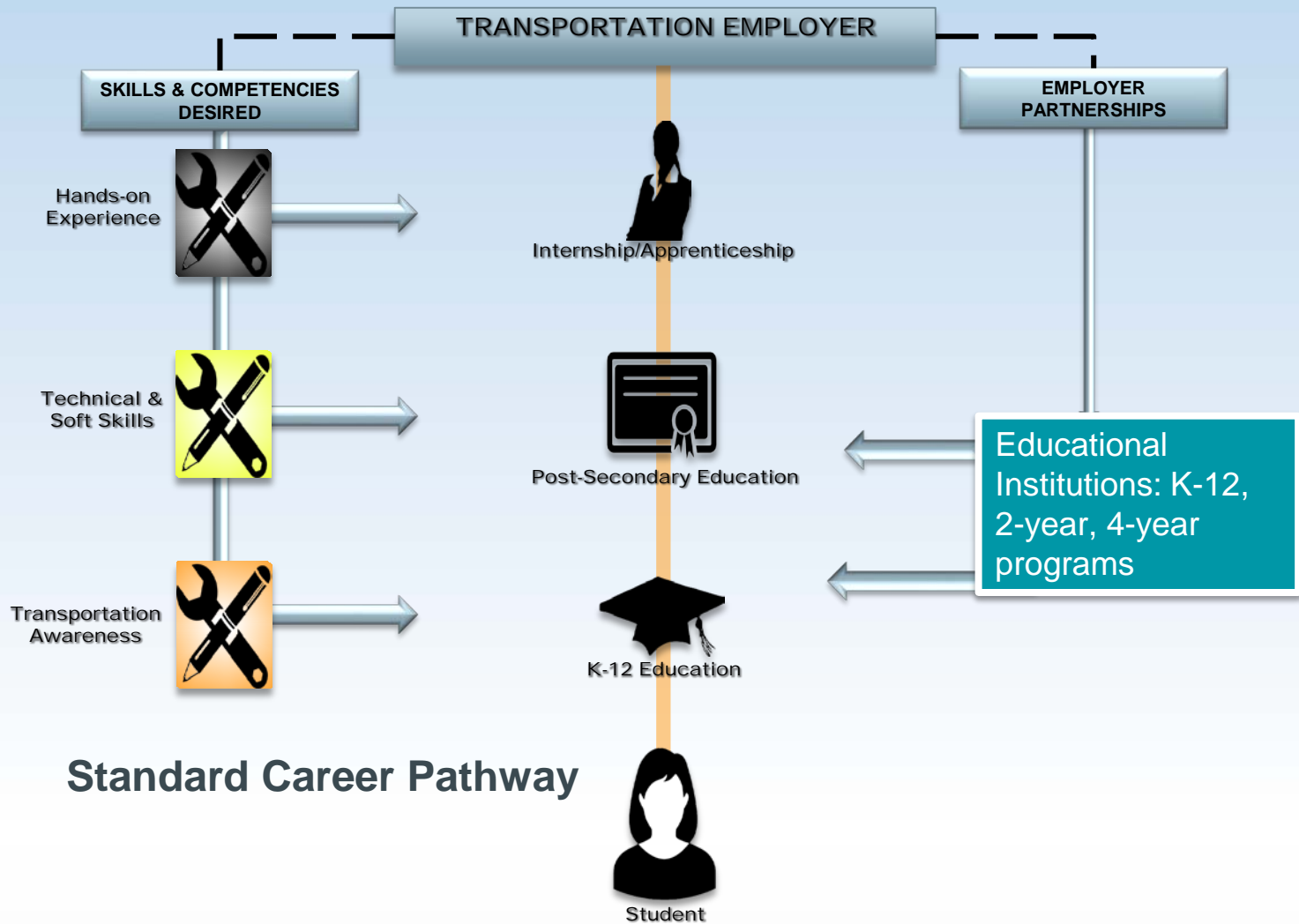
- Continuity of supply
- Integrated planning, execution and monitoring
- Quality assurance and customer driven approach (What is consumer experience?)
- Avoiding single enterprise silos (moving toward multi-stakeholder ecosystems)
- Improved visibility and transparency between partners
- Effective use of new technologies
- Planning for and managing disruptions
- Attention to cost

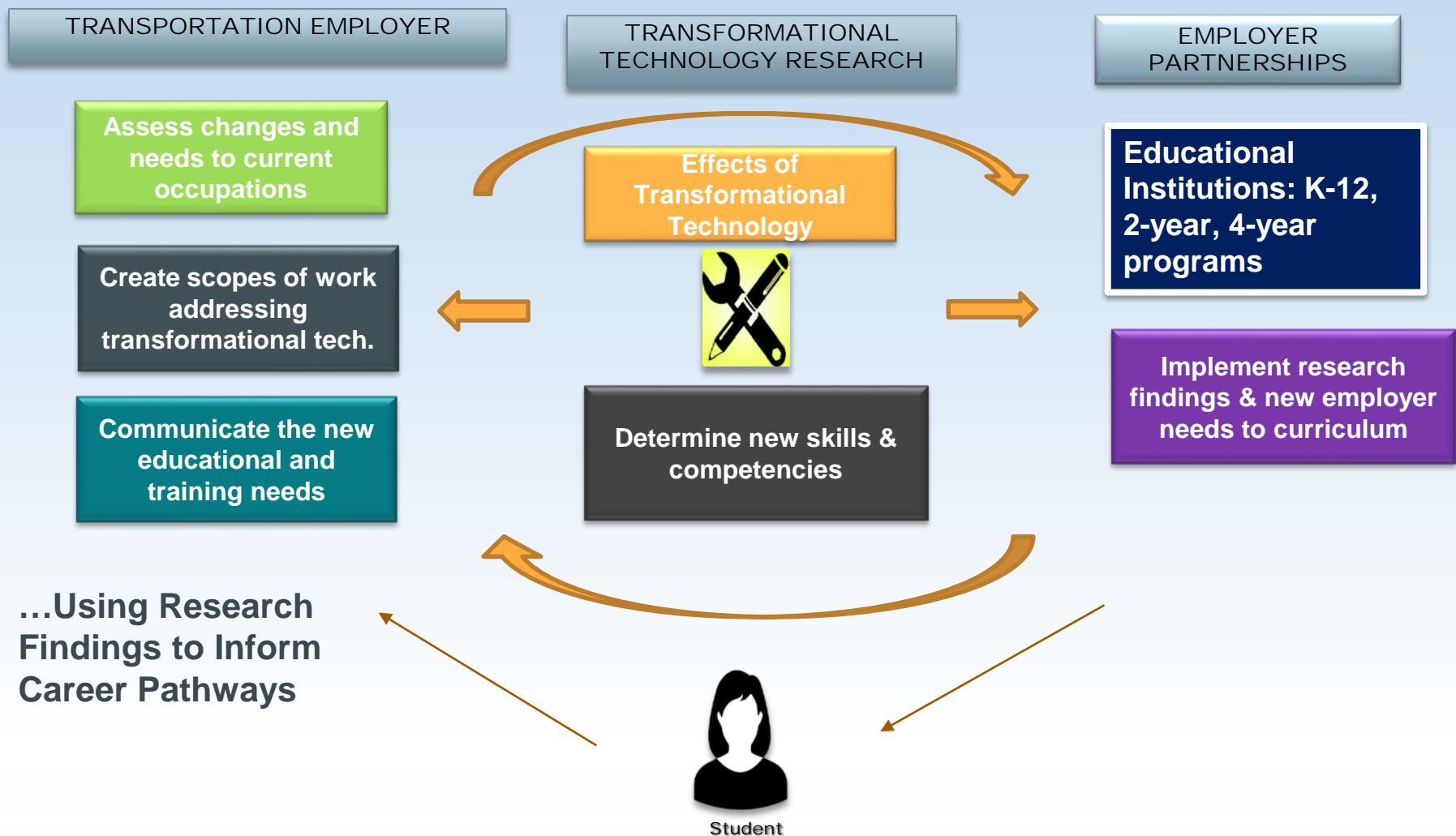
Supply Chain Thinking for Educators

- Focus on outcomes and not process (customer experience)
- Facilitate movement in and out of pathways
- Develop partnerships that facilitate work based learning
- Renewed focus on training the trainer
- Contextualize knowledge
- Recognize that there are many ways to learn (technology matters)
- Student support across traditional institutional boundaries is necessary

Supply Chain Career Pathway Examples







Resources

- Register to receive NNTW updates: <http://nntw.org/registration-form>
- NNWT Website: www.nntw.org
- SWTWC Website: www.swtwc.org



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Session Presenter



Ms. Leticia Barajas

Vice President of Pathway Innovation & Institutional Effectiveness, Los Angeles Trade-Technical College (LATTC)

Advanced Technologies - Implications for Workforce Development and Higher Education



- Transforming Training & Education - Los Angeles Trade Technical College
- Transition from course and hours-based instruction to industry-aligned, standards-based workforce training and education; identification foundational competencies and standards-based assessments
- Bridge Community to College to Career – engage communities and underrepresented groups



Training Delivery Targeted to Populations



Target Groups	Education & Training Programs	Effective Strategies & Partners
<i>Gen Z - Youth: Elementary - High School</i>	Transportation Youth Academy; Bridge to College	Project Based Learning & Exploration; Partner w/ K-12
<i>Opportunity Youth/Transitional Youth (16-24)</i>	Apprenticeship Preparation; Transportation Pathway Ready	Short-term, Modular Courses, Partner w/ Community Based Organizations, WIB
<i><u>New Entrants</u> 18-35 (Gen Y/Millennials) 36-48 (Gen X)</i>	College Degree & Certificate Programs – Rails Systems Technology; Transfer Programs; Flipped Classroom	College & Regional Training; Employers, SWTWC, Work-Based Learning
<i>Incumbent Workers</i>	Apprenticeship, Joint Apprenticeship Committee, Industry Certifications	Prior Learning Assessment, Online; Partner w/ Employers, APTA,



Transportation Workforce Institute



- New Innovative Unit to Meet the Transportation Industry Needs
 - FTA Workforce Innovation Grant
 - Focus on Innovation
 - “Incubation” Unit – Develop and Pilot Strategies
 - Competency Based Education & Credit for Prior Learning
 - Curriculum development to support internal training programs
 - Collaborative, regional training





Incumbent Worker Training & Skills Upgrade

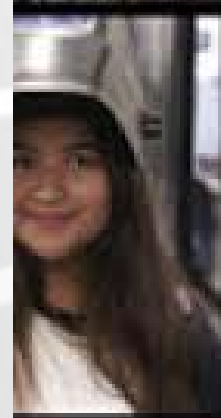
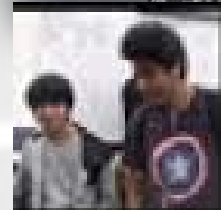
- Rail Systems Technology- Joint Apprenticeship Committee (JAC) Program
 - Collaboration with Metro – designed to meet LACMTA critical workforce needs
 - Promotional opportunity with focus on preparation “pre-apprenticeship” of ATU members for careers in rail vehicle repair
 - Providing foundational competencies aligned with entrance standards for industry
 - Connecting Employers, Labor and College

Focus: New Generation- Transportation Youth Academy



- Goal: Attracting youth to a career pathway in the Transportation industry
- Focus on exploration and project-based learning
- Preparing a new generation for careers
- Summer Program (2016) Year-Round and School Based Option
- Open Educational Resources





LATTC





Session Presenter

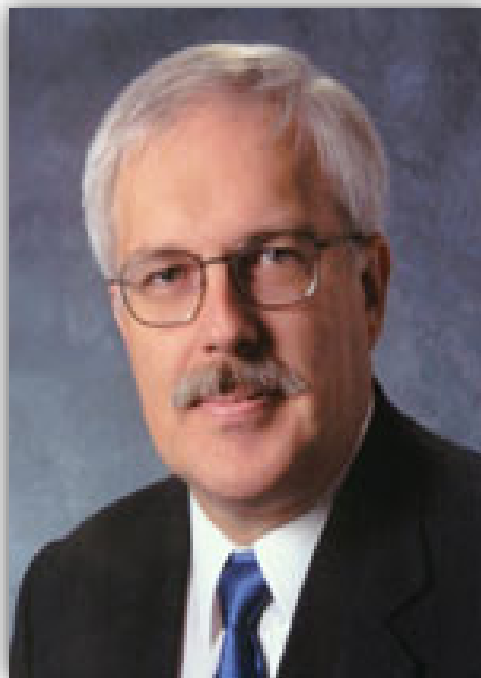


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Mr. Mike Loehr, PE

**Global Practice Leader, Transit and Rail, Track and Civil,
CH2M; Chair, BMBG Workforce Development Committee**



Identifying Industry Needs, Gaps, and Counter Measures



Our Industry-wide Issues

- Issues cross all sectors of the industry from product development to manufacturing, system design, operations, maintenance, and to product field support.
 - Our workforce continues to retire at rates higher than we are producing qualified replacements.
 - We don't have the right workforce with the skills for neither the highly technical area nor for the basic manual skills. Where do we get skilled technicians to deal with computerized vehicles and control systems?
- Public Transportation with its 24/7/365 operations isn't glamorous enough in a Dotcom world to attract the next generation.



Have the Issues been Quantified?

- Studies and Reports have document the issues.
 - Retirement of the Boomers
 - Loss of Institutional Knowledge
- Reports have also identified required skills and skill gaps .
 - Training Shortfalls
 - Evolving Technology



How do we address these issues?

- These issues are being addressed across a continuum

Population	Programs
K - 12	STEAM
Transition	APTA Youth Summit, Apprenticeships
Post Secondary, Under Graduate Education	Trade Colleges, University Programs, pREES
Post Graduate Education	University Programs, pREES
Work Force Training	OJT, Employer Provided Training, Continuing Education, NTI, Leadership APTA



What are we doing about it?

- APTA Youth Summit

- Supported jointly by the Agency Members and the Business Members
- Attract the brightest High School students from across the country and introduce them to our industry.
- Bridge STEAM programs into Post Secondary Programs



What are we doing about it?

- APTA / AREMA pREES

- Funded by the Business Members
- Hosted by SEPTA in 2015, and LATTC in 2017
- Addresses the loss of industry knowledgeable educators.
- Provides Educators with Industry Information, Training and Classroom materials.



What are we doing about it?

• CH2M Internal Training

- Developed by Practice Leaders
- Trains Engineers in related fields about Rail and Transit.
- Reduces rework and produces higher quality deliverables.
- Have shared materials with multiple clients and educators.

RAILROADING 101

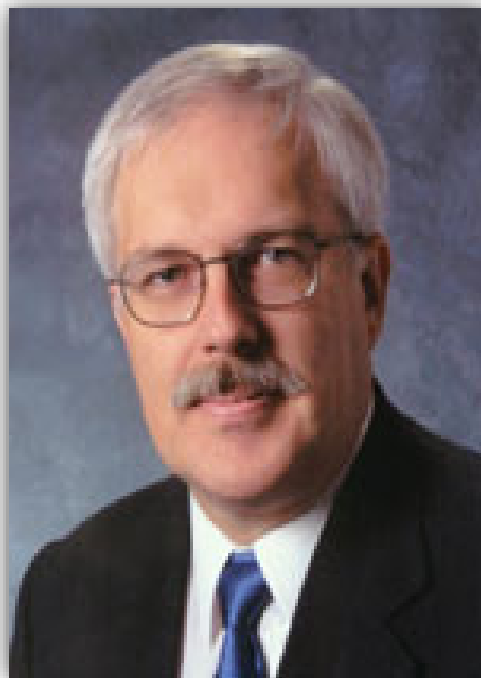
Part 2
Introduction to
Rail Engineering



ch2mSM



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**Global Practice Leader, Transit and Rail, Track and Civil,
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Ms. Joanne Peterson

**Chief Human Capital and Development Officer,
Los Angeles Metropolitan Transportation Authority**



Technological Impacts on the Workforce

by Joanne Peterson

Chief Human Capital & Development Officer of Los Angeles Metro

How Does Technology Impacts Our Work?

- It drives change!
- Changing skill needs
- Appropriate classification of the changing work
- Union boundaries that need to be redefined



What is your change management philosophy?



Start With the End in Mind

- What is your goal?
 - Cost reduction
 - Business development
 - Efficiency
- Define the joint interest of employees, unions, and management
- Respond to the changing customer expectation and needs



It is about ridership!



Skills, Knowledge, and Abilities

- Consider the cost of employee development in the project plan
- Understand what needs to be re-tooled
- Define clear competencies
- Leverage the loyalty and organizational knowledge of the current workforce



Train to a Standard

- Engage stakeholder in developmental training curriculum
- Incentivize new skill attainment
 - Having equal access to the workforce
 - Focus on employee engagement
 - Assessment of the new skills



A decorative network diagram in the top right corner, consisting of interconnected nodes in shades of blue, orange, and pink, connected by thin lines.

Thank you! Questions?



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**Chief Human Capital and Development Officer,
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