APTA Human Resources Committee &
APTA Business Member Board of Governors -
Workforce Development Subcommittee
Present
An Industry Webinar

APTA’s July 2015 p-REES Seminar:
Educating Engineer Faculty
about the Transit Industry

Wednesday, December 16, 2015
2:00 – 3:00 p.m. Eastern Time

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This session is being recorded and will be made available on the APTA web site.
Session Moderator

Ms. Lydia Grose

Director, Engineering and Design Civil Engineering, Southeastern Pennsylvania Transportation Authority (SEPTA)
Chair, APTA Human Resources Committee
A Partnership Webinar

- Business Member Board of Governors - Workforce Development Subcommittee
- APTA Human Resources Committee
What to Expect …

• Industry, Academic, and Audience Perspectives on July’s p-REES Seminar
• Discussions and Audience Q&A
• Wrap up
Today’s Presenters

Jeff Wharton
Mike Pochop
Mike Loehr
Bill Thomsen
Dr. Chris Barkan

Lydia Grose

Dr. Leslie McCarthy
Natalie Cornell
Dr. Candace Brakewood
Dr. Xiang Liu
Jess Guerra
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 Chat box on your screen and then click on the send arrow located at the bottom of the box.

Your questions will be answered after all presentations have been given.
Session Presenter

Jeff Wharton

President, IMPulse NC LLC
1st Vice Chair, APTA BMBG
We have a problem:

APTA business members can’t find the rail and transit engineering talent they need today and for the future.

The problem is going to get worse

- It crosses all disciplines – infrastructure, vehicles, communications, power, systems
- OEMs, suppliers, contractors all dealing with the issue
- We are stealing talent from one another rather than creating new talent
We are not alone

- Public agencies have the same problem
- Freight railroads have a problem
- Other associations are concerned
It’s not just a current supply problem – we need new generations who want to work in our industry.

- Current and new engineering student awareness
- Rail and transit career awareness needed in middle and high school and really need K-12!
- Build on the millennials growing use and support for transit
What APTA’s business members have done so far:

- Conducted initial member needs analysis and education resource survey in 2011
- Provided financial and program support for APTA Youth Summit
- Promoted need at National Transportation Workforce Summit
- Rail and transit engineering education breakfast at APTA conferences
- Identified new partners – AREMA, NURail Center, engage academic programs
- 2015 p-REES program in Philadelphia
Session Presenter

Jeff Wharton

President, IMPulse NC LLC
1st Vice Chair, APTA BMBG
Session Presenter

Mike Pochop, P.E.

Vice President, Civil Engineering, Hanson Professional Services, Inc.
Past Chair, Education and Training Committee, AREMA
AREMA REES Development

- Diagnosis: University Survey
- Committee 24 10x10 Program
- Railway Engineering Education Symposium
AREMA REES Content

• Railway Engineering Modules
• Academic and Industry Panels
• Railway Facility Site Visit
• Informal networking
AREMA REES Results

- New classes and programs
- AREMA Student Chapters
- p-REES Partnership
Session Presenter

Mike Pochop, P.E.

Vice President, Civil Engineering, Hanson Professional Services, Inc.
Past Chair, Education and Training Committee, AREMA
Session Presenters

Mike Loehr, P.E.
Americas Transit and Rail Practice Leader
Civil Engineering, CH2M Hill

Bill Thomsen, P.E.
President & CEO
Urban Engineers of New York
What does p-REES Address?

- p-REES, like REES, is designed to bring Educators and Industry Professionals together to address the Workforce Development needs of the Transit and Rail Industry in a fast-paced informative three day Seminar.
  - The need for Engineering BS Graduates that have a basic knowledge of the industry and its technology.
  - The need for Technical AS Graduates that understand the technology underlying modern Rail & Transit systems.
  - The need for Graduate with Advanced Degrees to perform the research to address emerging issues in the industry.
How is p-REES Delivered?

• Program Format
  – Seminar based on the Successful AREMA REES format
  – Technical Modules Presented by Educators and Industry Professionals
  – Organizational Modules Presented by Educators with existing Programs
  – Q&A Sessions
  – Networking Time
  – Field Trip

• Attendees
  – Professors and Educators
    • Existing Programs
    • Looking to Initiate or Expand Programs
What does p-REES Cover in Day 1?

• Vision for Railway Engineering Education
  – Safety
  – Introduction to the Railway Industry and Railway Engineering
  – Introduction to Railway Infrastructure
  – Train Energy, Power and Traffic Control
  – Railway Intermodal Transportation
  – Railway Alignment Design and Geometry
  – High Speed Rail Design
  – Transit, Regional and Intercity Passenger Rail Transportation

• Panel Discussion

• Group Dinner & Keynote Speaker
What does p-REES Cover in Day 2?

• Advanced Topics in Railway Engineering Education
  – Safety
  – Train Performance and Capacity
  – Advanced Train Operations (CBTC and PTC)
  – Vehicles

• Real World Challenges and Projects
  – Shared Corridor Challenges
  – Railway Engineering Project Overviews
  – Research Programs and Needs

• Railway Program Development
What does p-REES Cover in Day 3?

- Student Chapters
- Final Q&A Session
- Seeing the Industry in Action
  - Safety
  - Control Center Tour
  - Construction Site Field Visit
  - Facility Site Visit
What did the p-REES program deliver?

• It brought Educators and Industry Professionals together to address the educational needs of the Transit and Rail Industry
  – Drexel Professor Martin went back and initiated a new class.
  – Other colleges set the process in motion to evaluate the need for the program in the coming year.
  – We provided a general education on some of the specific technical aspects on the industry and how these can be taught to provide a better prepared graduate for grantees and consultants for the Transit Industry.
Case Studies discussed

• **Heartland Corridor** - Michael Loehr, CH2M

• **Second Avenue Subway** – Christopher K. Bennett, P.E., Vice President, AECOM

• **Illinois High Speed Rail Corridor** - Thomas R. Pavlick, P.E. Senior Supervising Engineer, Parsons Brinckerhoff

• **East Side Access** - William Thomsen, Urban Engineers
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Americas Transit and Rail Practice Leader
Civil Engineering, CH2M Hill

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President & CEO
Urban Engineers of New York
Session Presenter

Dr. Chris Barkan, Ph.D.
Professor, University of Illinois at Urbana-Champaign
Center Director, National University Rail (NURail)
Executive Director, Rail Transportation and Engineering Center (RailTEC)
National University Rail (NURail) Center

- University Transportation Centers (UTCs) are consortia of colleges and universities conducting research, education and technology transfer with a specific transportation-related focus
- UTC program funded by the US Department of Transportation: Office of the Assistant Secretary for Research and Technology
- Consortium of seven colleges and universities proposed the first ever rail-focused UTC in 2011, the National University Rail (NURail) Center
- Broad industry and government support
- Focusing on: Shared Rail Corridors and Economic Competitiveness
NURail Center Goals

Advancement of rail transportation through education, research, workforce development and technology transfer
NURail Faculty Involvement in p-REES

- NURail faculty members have been heavily involved in REES since its inception in 2008
- Comprised the REES academic content committee
- Initially developed teaching modules aimed at enriching rail content of existing transportation engineering courses (REES 1)
- Subsequently developed modules on more advanced rail topics (REES 2) that, along with REES 1 materials could be developed into a rail engineering course
- REES held every two years from 2008 through 2014, each time with about 25 – 30 faculty attendees
Principles of Rail Engineering and Transport

- Fundamentals of rail engineering and transport are largely the same for different rail services: freight, passenger and rail transit.
- AREMA REES content is largely freight-rail oriented.
- Adapted for p-REES by adding emphasis on aspects particular to passenger rail and transit.
- Important for faculty and students to understand general principles of rail engineering.
- Which aspects do rail services have in common, and which differ, and why?
Beyond p-REES

• Need to rebuild rail academic community at North American colleges and universities

• Industry engagement with academic community
  – Reach out to colleges and universities in your region
  – Emphasize employment and internship opportunities
  – Funding for rail academic programs is needed for both research and education

• Academic engagement with rail community
  – Develop understanding of rail workforce needs and research questions and opportunities
  – Rail organizations – APTA, AREMA, AAR and others
  – Academic organization rail sections and committees: ASCE, ASME, IEEE, INFORMS, TRB, etc.
  – Participate in Joint Rail Conference
Session Presenter

Dr. Chris Barkan, Ph.D.

Professor, University of Illinois at Urbana-Champaign
Center Director, National University Rail (NURail)
Executive Director, Rail Transportation and Engineering Center (RailTEC)
Dr. Leslie McCarthy, Ph.D., P.E.

Assistant Professor, Civil and Environmental Engineering, Villanova University, College of Engineering
Session Presenter

Natalie Cornell

Director, Business Development
LTK Engineering Services
Industry Consultants

• The need for more Engineers overall
  – All engineering disciplines, including Civil, Electrical, Power, Computer, Communications, Mechanical, Geotechnical, Environmental, Industrial, Transportation

• The need for other Disciplines
  – Planners, Environmentalists, Architects, Industrial Designers, System Safety, Media, Fire Life Safety, MEP

• The need for basic training at institutions of higher education
  – Many in-house training programs to build the most basic proficiencies related to Rail & Transit Industry
  – Cross Training of Highway, Aerospace, and other engineers to become Rail & Transit Engineers
Session Presenter

Natalie Cornell

Director, Business Development
LTK Engineering Services
Dr. Candace Brakewood, Ph.D.

Assistant Professor, Civil Engineering
City College of New York
My experience as a p-REES attendee

- p-REES provides junior faculty with important exposure to the railroad industry they may not have gotten during their PhD / post doc

- The materials from the workshop are a great starting point for developing course lessons
  - Single lectures and/or an entire course

- Great potential for positive, long term educational impacts
Session Presenter

Dr. Candace Brakewood, Ph.D.
Assistant Professor, Civil Engineering
City College of New York
Session Presenter

Dr. Xiang Liu, Ph.D.

Assistant Professor, Civil Engineering
Rutgers University
Rail educational and research activities at Rutgers University

- The first rail-centric course “Rail Transportation System” was offered in Spring 2015 (17 student enrollments)

- The first AREMA student chapter at Rutgers was established in Fall 2015

- Several faculties in Civil Engineering Department are currently working on a number of rail-related projects, covering
  - Railroad hazmat transportation risk management
  - Broken rail risk analysis
  - Grade crossing safety
  - Rail temperature control
The p-REES seminar brought multi-fold benefits to our work at Rutgers

- It offered an informative, concise, and useful summary of the key elements in railroad transportation and engineering

- It facilitated a great networking opportunity for us to meet with other academic colleagues, and the professionals from government agencies and consulting firms

- It promotes the awareness of the importance of rail-related education and research within transportation community

- Finally, I am very grateful to the travel scholarship offered by APTA, and appreciate the opportunity of participating in this successful event
My “two cents” for future seminars

• Continual offering of railroad educational seminars to keep us informed of the latest progress in rail industry

• More “champion” is needed to inform the transportation community of the importance of rail education

• Invite industry speakers to introduce pressing problems that may call for new research

• Maybe have a “student research showcase” session to let students interact with other researchers and industry professionals
Session Presenter

Dr. Xiang Liu, Ph.D.

Assistant Professor, Civil Engineering
Rutgers University
Session Presenter

Jess Guerra

Chairman, Advanced Transportation & Manufacturing, Los Angeles Trade Technical College (LATTC)
Director, Transportation Workforce Institute
Rail Systems Technology at LATTC

• Awarded FTA Innovative Public Transportation Workforce Development grant to establish the **Transportation Workforce Institute**
  – Frontline transportation workforce development
  – Develop and deliver training to incumbent workers and new entrants in all areas of Transportation
  – Special focus on Rail systems training

• LATTC’s Rail Systems Technology Degree/Certificate with four areas of emphasis:
  – Rail Vehicle Maintenance
  – Traction Power
  – Electronic Communications
  – Signal Inspection
The p-REES Experience

• Created faculty a network to share best practices and resources

• Facilitators from various areas in rail- transit, commuter, and freight

• Sessions had a variety of helpful topics: Infrastructure, Transit Rail systems, Traffic Control, High Speed Rail, etc.

• Provided training materials that can be integrated into any program
p-REES Impact on LATTC

- Training materials are now used as part of Rail System Training for both incumbents and new entrants
- Bridged technical training with engineering at our campus
- Alignment of our current programs and student competencies with universities to ensure seamless transfer into engineering majors with a transportation focus
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