

NATIONAL SIGNALS TRAINING CONSORTIUM ORIENTATION

OCTOBER 26, 2015

Agenda – Day One

Welcome and Introductions

Overview of Signals Project

- Background and Scope
- Courseware Development Process
- Return on Investment

Finding Overlap

Review Timeline/Progress

Courseware Update

Review Agenda for the Week

ADJOURN

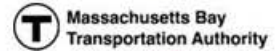
The Transportation Learning Center

The Transportation Learning Center is a nonprofit organization dedicated to improving public transportation at the national level and within communities. To accomplish this mission, the Center builds labor-management training partnerships that improve organizational performance, expand workforce knowledge, skills and abilities, and promote career advancement.



Training Partnerships in Transit – Location Map

National sponsors and over 40 locations have worked together to build shared solutions



Everett
Seattle
Tacoma
King County



Portland



Sacramento
San Francisco
San Jose

Salt Lake City

Minneapolis



Buffalo

Syracuse

Boston



Utah

Denver



Cleveland

Allentown

Altoona

New York City



Utah

Denver



Chicago

Pittsburgh

Columbus

Harrisburg

Washington, DC



Los Angeles
San Diego

Utah

Denver



Chicago

Pittsburgh

Columbus

Harrisburg

Washington, DC



Los Angeles
San Diego

Utah

Denver



Chicago

Pittsburgh

Columbus

Harrisburg

Washington, DC



IBEW Local 6 (San Francisco)
IBEW Local 9 (Chicago)
IBEW Local 103 (Boston)
IBEW Local 465 (San Diego)
IBEW Local 1245

SEIU Local 1021 (Sacramento)



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TWU Local 100 (NYC)
TWU Local 208 (Columbus)
TWU Local 234 (Philadelphia)

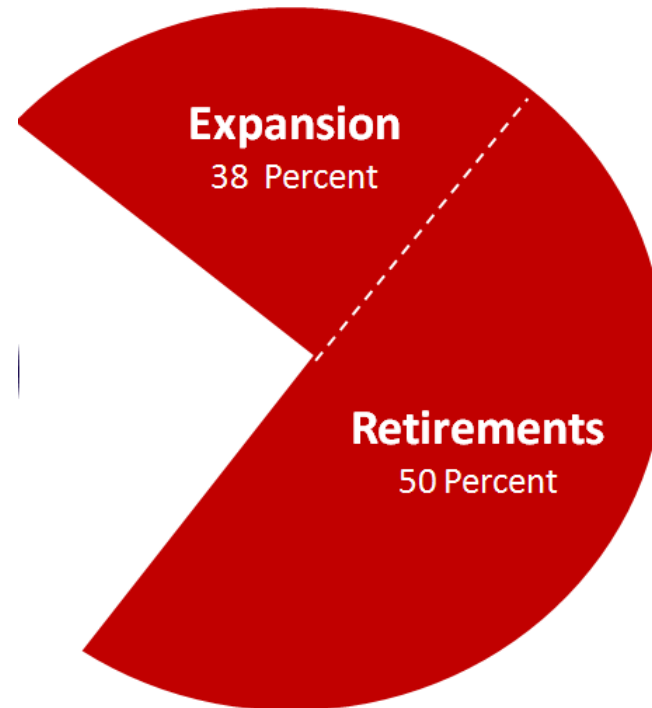


Miami

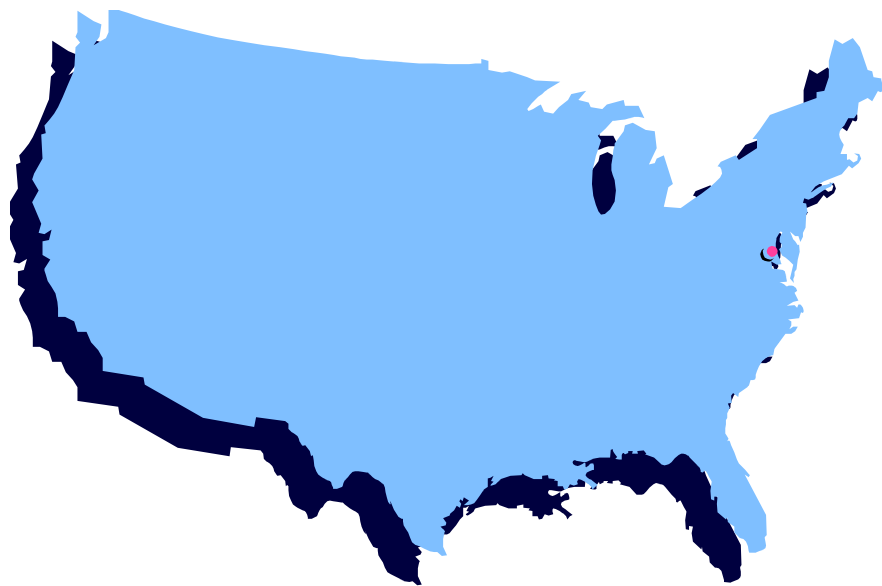
TWU Local 100 (NYC)
TWU Local 208 (Columbus)
TWU Local 234 (Philadelphia)

Project Background

- Built off of Industry effort of developing training standards



WELCOME AND INTRODUCTIONS



Participating Locations	
Agency	Union
BART	SEIU 1021
CATS	
Capitol Metro	
Denver RTD	ATU 1001
GCRTA	ATU 268
Keolis	BRS
LACMTA	ATU 1277
LIRR	BRS
MBTA	IBEW 103
Metra	BRS
Metro North	ACRE
MetroTransit	ATU 1005
MD MTA	ATU 1300
NFTA	ATU 1342
PATCO	IBT 676
SacRT	IBEW 1245
San Diego MTS	IBEW 265
SEPTA	TWU 234
TriMet	ATU 757

Project Goal:

Create a nationally recognized standard hands-on and classroom training program/ minimum requirement - recognized by industry and the relevant unions - which includes train the trainer, mentoring, nationally recognized apprenticeship program.

Added Value

- Address **retirements** and expansion, retirements of current workers, expansion of rail, address limitations in training capacity,
- Addresses changes in **technology**,
- Address **lack** of training at small locations and **supplements** training at larger locations
- Address training for **new hires** and **incumbents**
- **Cost savings** involved in developing as a group instead of individually
- Decrease **Liability**

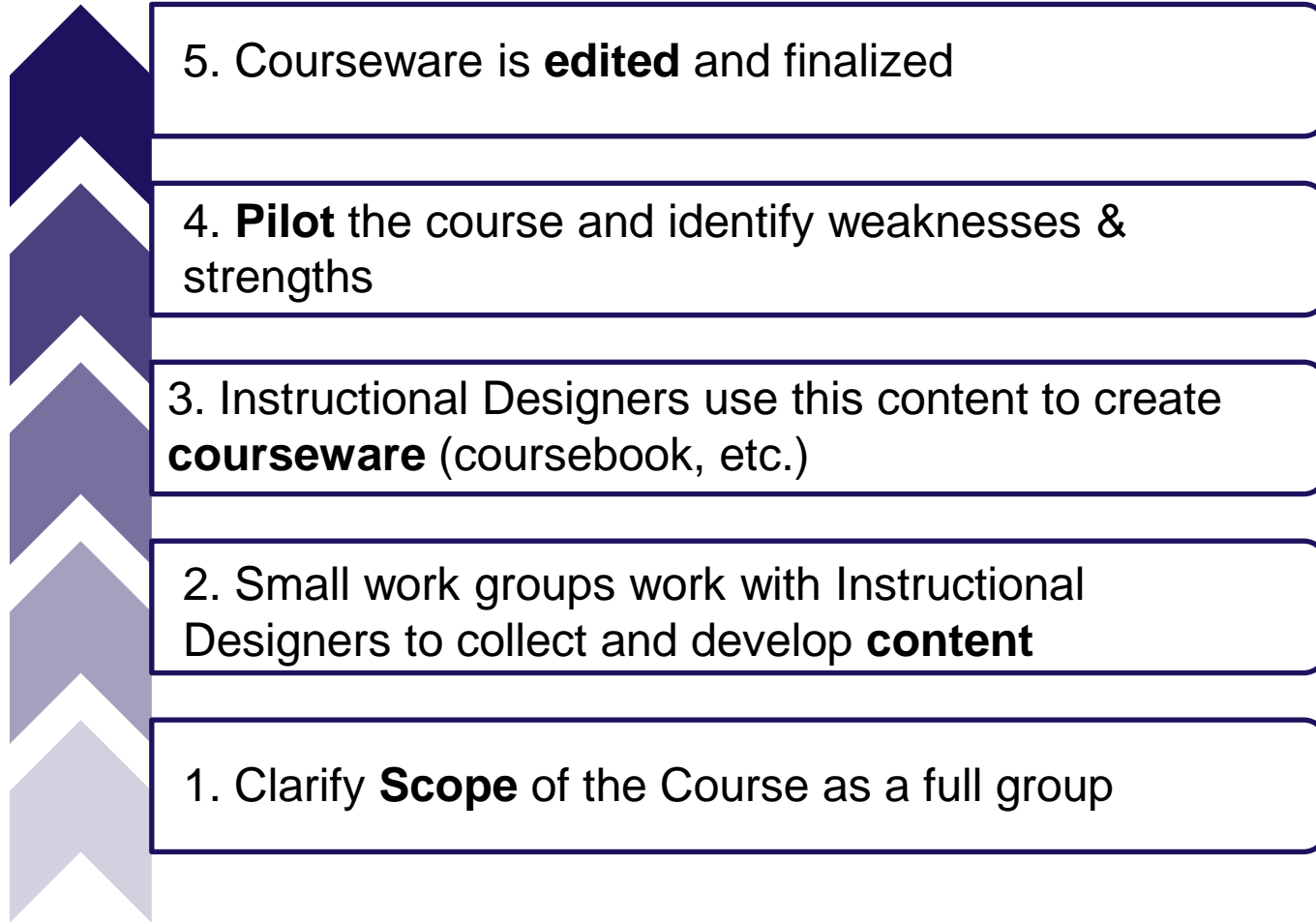
Added Value (continued)

- Bring Training **In-house**
- Expand **Training Capacity/Quality**
- Create an **accreditation** structure for the properties (by the signals training consortium)
- **Sharing** amongst members:
 - **Technology** Tips
 - **Training** Tips
 - **Parts**
 - **OEM contacts**
- The **ONLY** forum for frontline worker/trainer **networking**

Development & the Role of the Standards

- Standards are a tool for instructional designers and instructors
- Developed by industry experts and users
- Continuously reviewed and updated
- Used by instructors and trainers to ensure minimum standards are met when curriculum is developed
- Can significantly reduce the time to create training classes

Courseware Development Process



1. Clarify Course Scope as Full Group

- Identify scope of each course
- Edit/Draft Learning Objectives
- Brainstorm on existing resources

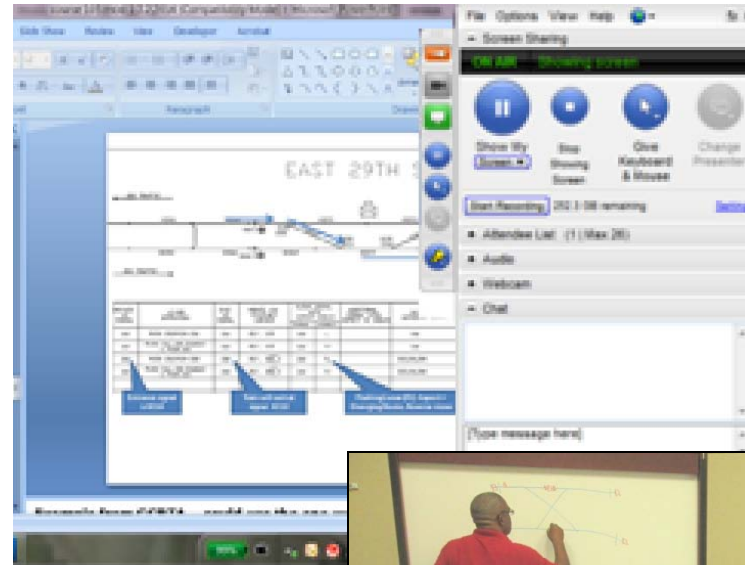


Learning Objectives for Course 202: Inspection and Maintenance 1.27.2014, [Compatibility Mode] - Microsoft Excel

C20	Demonstrate ability to check and adjust point tension (aka point tension test)	
1	witches	References
3	Course 202: Inspection and Maintenance of Switches	
19	Module 3- Generic I & M of Switches and Derails and Related Components	
26	Inspect and maintain throw rod (aka operating rod)	
27	Describe purpose and components of locking	
28	Inspect and maintain point detector rods (indication rod)	
29	Inspect and maintain switch circuit controller	236.103
30	Inspect and maintain switch point heaters/snow melters (where applicable)	
31	Inspect and maintain moveable pt frogs (movable frog measure 4" from pt)	
32	Demonstrate Ability to perform a test on the switch restoring circuit (applies to electrical and e-h)	FRA 236.386
33	Demonstrate ability to perform point Detector Test	FRA 36.103, 236.334, 236.342
34	Demonstrate ability to perform obstruction tests	FRA 236.382
35	Demonstrate ability to perform obstruction test on lifting block derails - obstruction is placed at a different place (LIRR has these)	
36	Demonstrate ability to perform overload test	
37	Module 4: Inspection & Maintenance of Manual Switches and Related Components	
38	Inspect and maintain electric locks (where applicable)	
39	Inspect and maintain spring switch	

2. Small Work Groups Develop Content

- Live Meetings
- Site Visits
- Webinars
- Review of each module by a site that wasn't involved in developing content



Gathering Content Through Webinar

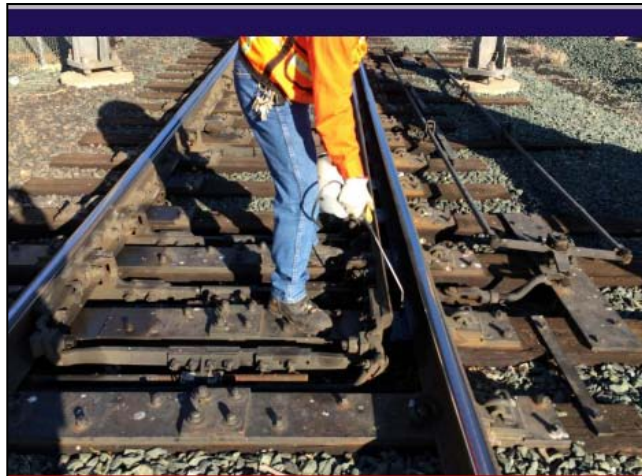
Track Circuits Tuesdays	Grade Crossings Wednesdays	Train Stops Wednesdays	Switches Thursdays
Amri Joyner (ISD)	Melissa Huber (ISD)	Yvonne Syphax (ISD)	Julie Deibel (ISD)
Adam Barrett	Michael Berko	James Acker	Harry Baumann
Dennis Boston	Keith Bounds	Frank Burnett	Lynelle Butterfield
Frank Bumett	Fred Byle	Anthony Candarini	Brad Bymes
Danny Chan	Melvin Clark	Pedro Colon	Ryan Roberts
Michael Cormiae	Mike Connor	Jan Marie Hagan	Gary Tegler
Chris Elliott	Anthony Forcina	Ed Kawecki	Rick Traxler
Mark Evans	Rick Lawrence	Tim Long	
Mario Gutierrez	Charlie Rudd	Mike Monastero	
Felix Marten	Robert Smith	Bill Shaw	
Gary Manthey	Tim Tarrant		
John Vogler	Derek Weldon		

Track Circuits							Grade Crossings							Train Stops							Switches						
DECEMBER 2013														JANUARY 2014													
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
8	9	10	11	12	13	14	8	9	10	11	12	13	14	8	9	10	11	12	13	14	8	9	10	11	12	13	14
15	16	17	18	19	20	21	15	16	17	18	19	20	21	15	16	17	18	19	20	21	15	16	17	18	19	20	21
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FEBRUARY 2014														MARCH 2014													
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23	24	25	26	27	28		23	24	25	26	27	28	29	23	24	25	26	27	28	29	23	24	25	26	27	28	29

3. Instructional Designers turn Content into Courseware

- Coursebook
- PowerPoint Presentations
- Instructor Guides
- Quizzes
- Videos

Signal Maintenance Courseware Example



Inspection and Maintenance of Switches and Derails

Course 202

PARTICIPANT GUIDE

SIGNALS TRAINING CONSORTIUM

Inspection and Maintenance of Switches and Derails

Inspection & Maintenance of Electric Switches and Derails

SIGNALS TRAINING CONSORTIUM

I & M of Electro-Pneumatic Switches/Derails

Instructor's Guide

Module Length: 190 min Time remaining: 120 min This section: 45 min (9 slides) Section start time: Section End Time:

DO	SAY	Materials Needed
<p>REVIEW slide</p> <p>Multimedia</p> <p>INDIVIDUAL ACTIVITY</p> <p>Instructor's Notes</p>	<p>In your own words: This video from LIRR outlines the steps in performing a switch restoring circuit test in the field for an electro-pneumatic switch and derail. After watching this video, I'm going to ask for volunteers to outline these steps, so please take notes. <i>Play the video. Ask for volunteers to outline the steps/safety checks. Have one participant scribe responses.</i> <i>Advance Slide</i></p> <p><i>Go over steps outlined on slides 29 and 30 and compare to participant responses.</i> <i>Advance Slide</i></p>	<p>✓ PPT slides 28, 29, 30</p> <p>✓ Internet connection or downloaded video</p>

SIGNALS TRAINING CONSORTIUM

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QUIZ ANSWERS

- According to FRA Safety Data, what is the leading cause of all train accidents?
Human Factors
- What are your agencies operation and safety procedures?
Site Specific
- What tools are needed for track circuit inspection and maintenance and what are they used for?

Tool	Use
Multimeter	Make accurate measurements of AC and DC voltage, direct current, resistance, and output voltage
Megger	Measures insulation resistance
Shunt box and shunt straps	Simulates a train so that other signaling devices in the track circuit may be tested to show occupancy
Oscilloscope	Displays a graph of an electrical signal
Insulated Joint checker	Used with a meter to check for intermittent shorts in insulated joints
Relay testers	Measures the characteristics of voltage and current of track relays
Rail sniffer	Measures the current that it is being used in a track circuit
Railroad Tester	Perform standard maintenance tasks
AAR Terminal Wrench	Adjusts terminals by tightening or loosening them

- What determines inspection and maintenance schedules?
 - Federal, state, and local regulations
 - OEM-recommended intervals
 - Industry experience
 - Operating environment and conditions
 - Historical data
 - Reliability-centered maintenance program development
 - Failure analysis
 - RTS testing and experience
 - Regulatory requirements
- What are your agency's reporting procedures?
Site Specific

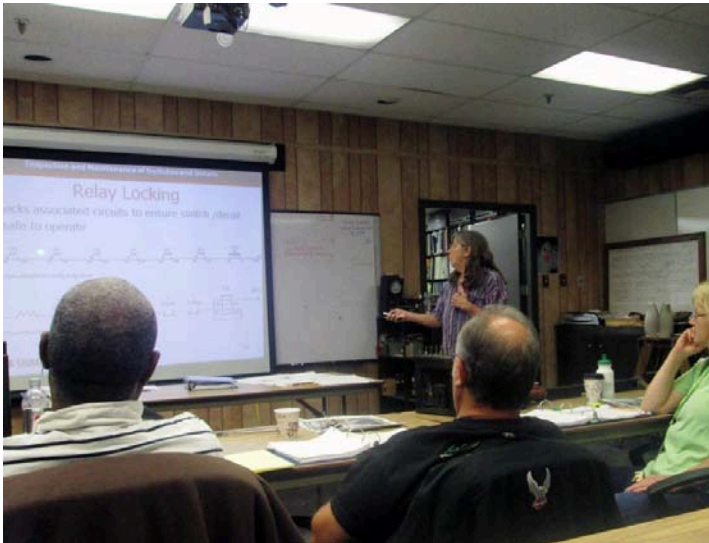
Consortium Developed Videos

The screenshot displays the YouTube channel for the Signals Training Consortium. At the top, the channel name is "Signals Training Consortium" with 2 subscribers and a "Video Manager" link. A large banner image shows a group of approximately 20 people, the consortium members, standing in a workshop or training facility. Below the banner, the channel's navigation tabs include Home, Videos, Playlists, Discussion, and About. The "Videos" tab is selected, showing a grid of 12 video thumbnails. Each thumbnail includes a title, a view count, and a timestamp. The videos cover various topics such as valve workings, magnet tests, man tests, feature restoration, gate operations, locking mechanisms, locking bars, contact tension tests, overload tests, switch restoring, and point tension tests.

Video Title	Views	Timestamp
202 Recall CP valve workings	1 week ago	1:15
202 6 4 Switch and Valve Non Correspondence Test	4 views 1 week ago	2:09
202 6 3 Lock Magnet Test	1 view 1 week ago	2:02
202 6 2 Minute Man Test	1 view 1 week ago	2:56
restoring feature 3 24 2014	2 views 1 week ago	1:42
Gate Operation - Synchronized Lights	5 views 1 month ago	0:47
locking mechanism 1 27		3:08
locking bars		3:28
contact tension test		0:45
Overload Test		2:20
Switch Restoring Test		1:48
point tension test both side		7:09

4. Pilots

- Make sure timing works
- Find any errors
- Identify strengths/weaknesses of course
- Collect data



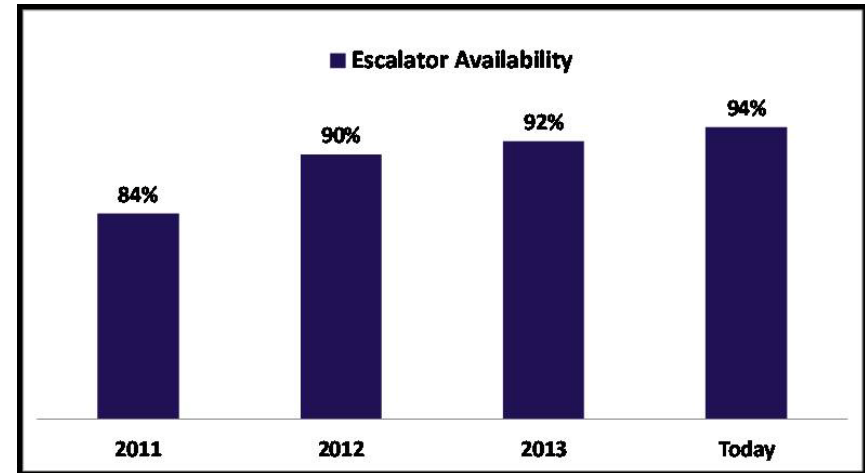
Pilot at MBTA



Evaluation – Return on Investment Transit Elevator/Escalator Example

EI/Es Maintenance Labor Cost Comparisons External vs. In-house for 2-Technician Crews					
	Estimate	External Contractors (2 person crew)	In-house Specialists (2 person crew)	Hourly Savings (2 person crew)	Annual Savings (based on 20 F/T technicians)
Agency A	Low	\$380	\$136	\$217	\$4,336,000
	High	\$558	\$163	\$422	\$8,440,000
Agency B	Low	\$400	\$130	\$270	\$5,400,000
	High	\$550	\$130	\$420	\$8,400,000

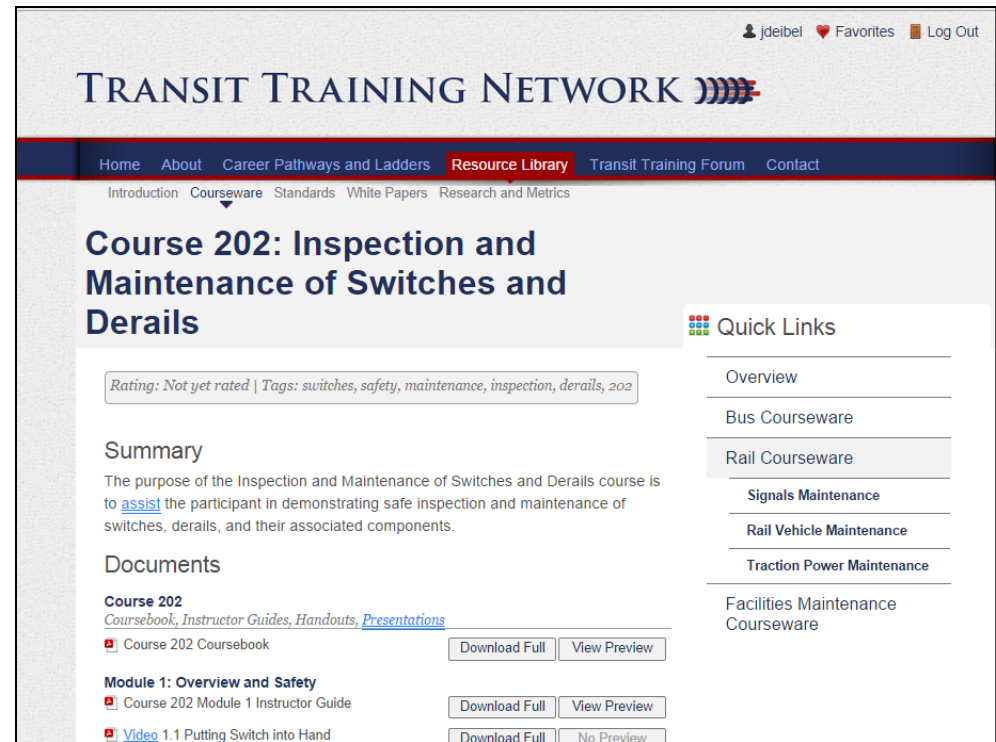
SEPTA secures Maintenance work from PATC - Consortium Cultivates In-house Expertise and Saves EI/Es Maintenance Costs



WMATA Increases Escalator Availability over Five Years

5. Courseware is Finalized

- Courseware is updated and finalized
- Courseware is accessible to all members through Transit Training Network



The screenshot displays the Transit Training Network website interface. At the top, the user 'jdeibel' is logged in, with options for 'Favorites' and 'Log Out'. The main navigation bar includes 'Home', 'About', 'Career Pathways and Ladders', 'Resource Library' (highlighted), 'Transit Training Forum', and 'Contact'. A secondary navigation bar lists 'Introduction', 'Courseware', 'Standards', 'White Papers', and 'Research and Metrics'. The main content area features the title 'Course 202: Inspection and Maintenance of Switches and Derails'. Below the title, it shows a rating of 'Not yet rated' and tags: 'switches, safety, maintenance, inspection, derails, 202'. The 'Summary' section states the course's purpose is to assist participants in demonstrating safe inspection and maintenance of switches, derails, and their associated components. The 'Documents' section lists three items: 'Course 202 Coursebook', 'Course 202 Module 1 Instructor Guide', and 'Video 1.1 Putting Switch into Hand'. Each document has 'Download Full' and 'View Preview' buttons. On the right side, a 'Quick Links' sidebar lists 'Overview', 'Bus Courseware', 'Rail Courseware' (highlighted), 'Signals Maintenance', 'Rail Vehicle Maintenance', 'Traction Power Maintenance', and 'Facilities Maintenance Courseware'.

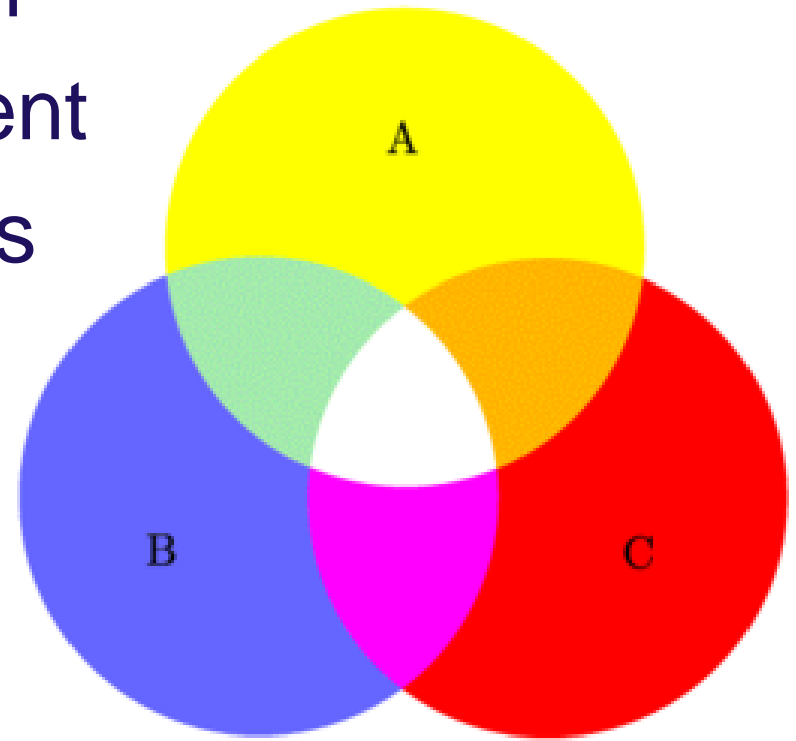
Previews available at www.transittraining.net

Transit Training Tutorial

The screenshot shows the website interface for the Transit Training Network. At the top right, there are user options: 'jdeibel', 'Favorites', and 'Log Out'. The main header reads 'TRANSIT TRAINING NETWORK' with a logo of five vertical bars of varying heights. Below the header is a navigation bar with links: 'Home', 'About', 'Career Pathways and Ladders', 'Resource Library' (highlighted), 'Transit Training Forum', and 'Contact'. Underneath, a secondary navigation bar includes 'Introduction', 'Courseware', 'Standards', 'White Papers', and 'Research and Metrics'. The main content area features the course title 'Course 202: Inspection and Maintenance of Switches and Derails'. A rating box indicates 'Rating: Not yet rated' and lists tags: 'switches, safety, maintenance, inspection, derails, 202'. A 'Summary' section explains the course's purpose. A 'Documents' section lists resources like 'Course 202 Coursebook', 'Course 202 Module 1 Instructor Guide', and 'Video 1.1 Putting Switch into Hand', each with 'Download Full' and 'View Preview' buttons. On the right, a 'Quick Links' sidebar lists 'Overview', 'Bus Courseware', 'Rail Courseware' (highlighted), 'Signals Maintenance', 'Rail Vehicle Maintenance', 'Traction Power Maintenance', and 'Facilities Maintenance Courseware'.

Finding Overlap

- Different Locations
- Transit and Commuter
- Labor and Management
- Different Technologies



Courseware Map

Topic Areas	100 Level Overview	200 Level Inspection & Maintenance	300 Level Testing, Troubleshooting & Repair/Replacement
Overview	Course 100 History and purpose of signal systems Fail safe principles Safety Principles Rail roadway worker protection Safe train operation/expedited train movement Regulatory/regulations (importance of testing) Signal System Operation Function and purpose of signal equipment and defining Advanced test equipment Railroad Specific Nomenclature Railroad Specific Relay Logic Location Specific Orientation (property rules, etc)	Not Applicable	Not Applicable
Power Distribution	Course 101 Power Distribution Inspection and Maintenance	Course 201 Power Distribution Inspection and Maintenance	Course 301 Power Distribution testing, troubleshooting and Repair
Track Circuits	Course 102 Intro and Overview to Track Circuits	Course 202 Inspection and Maintenance of DC Track Circuits Inspection and Maintenance of AC track circuits Inspection and Maintenance of Track circuit protective devices Inspection and Maintenance of Coded track circuits Inspection and Maintenance of Audio Frequency Equipment	Course 302 Testing, troubleshooting & repair/replacement DC Track Circuits Testing, troubleshooting & repair/replacement AC track circuits Testing, troubleshooting & repair/replacement Track circuit protective devices Testing, troubleshooting & repair/replacement Coded track circuits Testing, troubleshooting & repair/replacement Audio Frequency Equipment (AFO/AFV) Using frequency shift key (FSK) Testing, troubleshooting & repair/replacement Advanced track circuit and transmission/receiving Troubleshooting
Switches & Train Stops	Course 103 Intro and Overview to Switches and Derails	Course 203 Inspection and Maintenance of Switches and related components Inspection and Maintenance of Mechanical Train Stops Inspection and Maintenance of Magnetic Train Stops Inspection and Maintenance of Wheel Pick-ups Inspection and Maintenance of Derails	Course 303 Testing, troubleshooting & repair/replacement of switches and their components Testing, Troubleshooting & Repair/Replacement of Mechanical Train Stops Testing, Troubleshooting & Repair/Replacement of Magnetic Train Stops Testing, Troubleshooting & Repair/Replacement of Wheel Pick-ups Testing, Troubleshooting & Repair/Replacement of Derails
Grade Crossing	Course 104 Intro and Overview to Grade Crossings	Course 204 Grade Crossing Inspection and Maintenance	Course 304 Grade crossing warning system testing, troubleshooting and Repair
Signals	Course 105 Intro and Overview to Cab and Wayside Signaling	Course 205 Signaling Systems Wayside signaling Train wayside communication (TWC)	Course 305 Describe General Testing Procedures Signaling Systems Wayside signaling Train wayside communication (TWC)
Interlocking	Course 106 Intro and Overview to Interlockings	Course 206 Interlocking Inspection and Maintenance	Course 306 Interlocking testing, troubleshooting and Repair
Control Panels	Course 107 Intro and Overview to Control Panels	Course 207 Local control panels/human machine interfaces (HMI) New Technology	Course 307 Local control panels/human machine interfaces (HMI) New Technology

This Week's Agenda

AGENDA	
AGENDA – DAY 1	
Tuesday October 27, 2015 Metra	
Assemble in the Lobby to go to Meeting Space	
8:00AM	
1. Welcome and Introductions (<i>Mike Monastero, Jim Lindsay</i>)	8:30
<ul style="list-style-type: none">• Review of Meeting Agenda• Review/Edit Breakout Group Discussion Guidelines	
2. Breakout Groups – Peer Review*	9:00
<ul style="list-style-type: none">• Cab & Wayside Signaling• Control Panels• Power Distribution	
3. Report back from small groups	11:00
4. Breakout Groups – Address Peer Edits*	11:30
<ul style="list-style-type: none">• Cab & Wayside Signaling• Control Panels• Power Distribution	
WORKING LUNCH	1:00 PM
5. Report back from small groups during working lunch	
6. Scope Update (<i>Mark</i>)	1:30
<ul style="list-style-type: none">• FTA funding• New Tasks• Documenting time and in-kind• Review Timeline/Progress	
7. Future of the Consortium	2:00PM
8. Adjourn	2:30PM
9. Homework – fill out Training Needs Analysis Survey	

Added Value

- Address **retirements** and expansion, retirements of current workers, expansion of rail, address limitations in training capacity,
- Addresses changes in **technology**,
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Questions?