National Signals Training Consortium Orientation

October 26, 2015

SIGNALS TRAINING CONSORTIUM

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

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

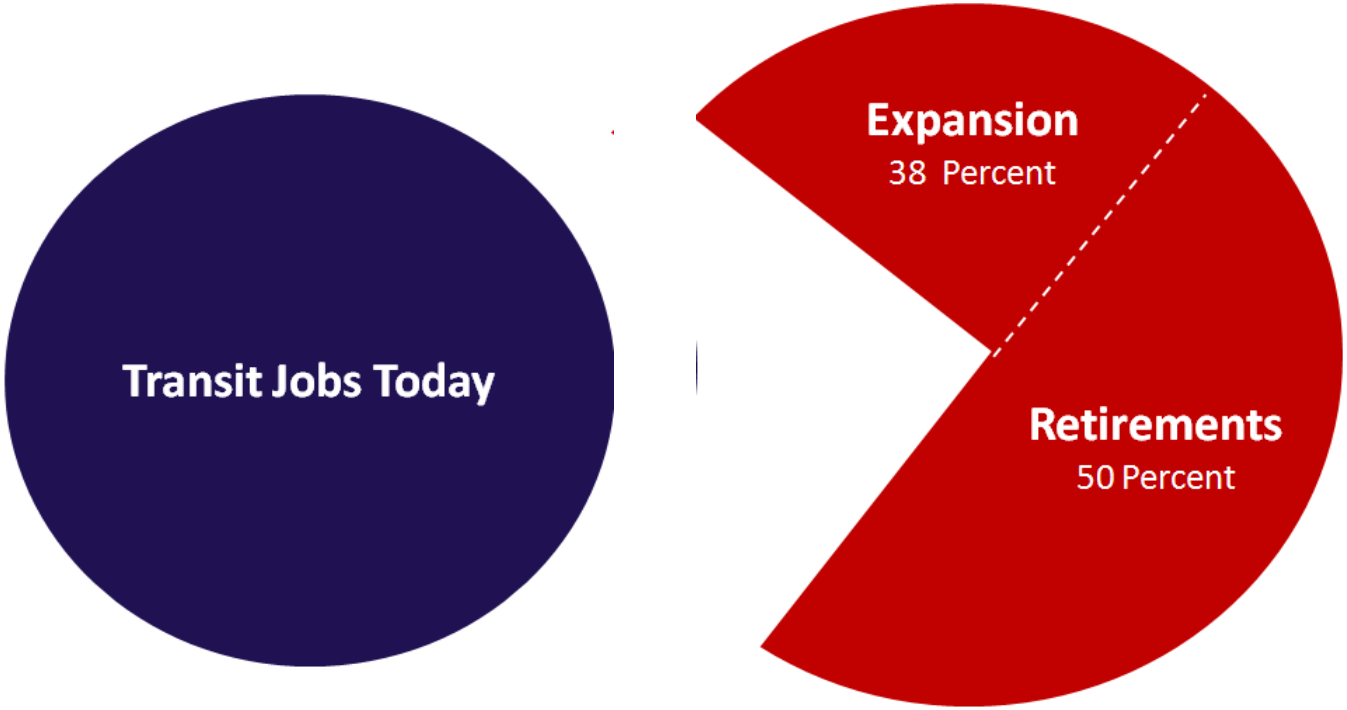
SEIU Local 1021 (Sacramento)

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

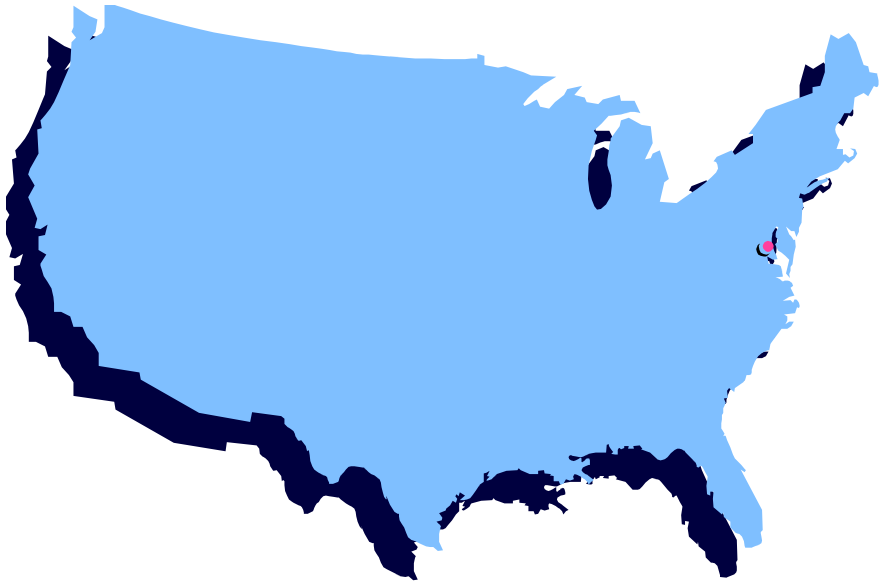
TRANSPORTATION LEARNING CENTER

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**

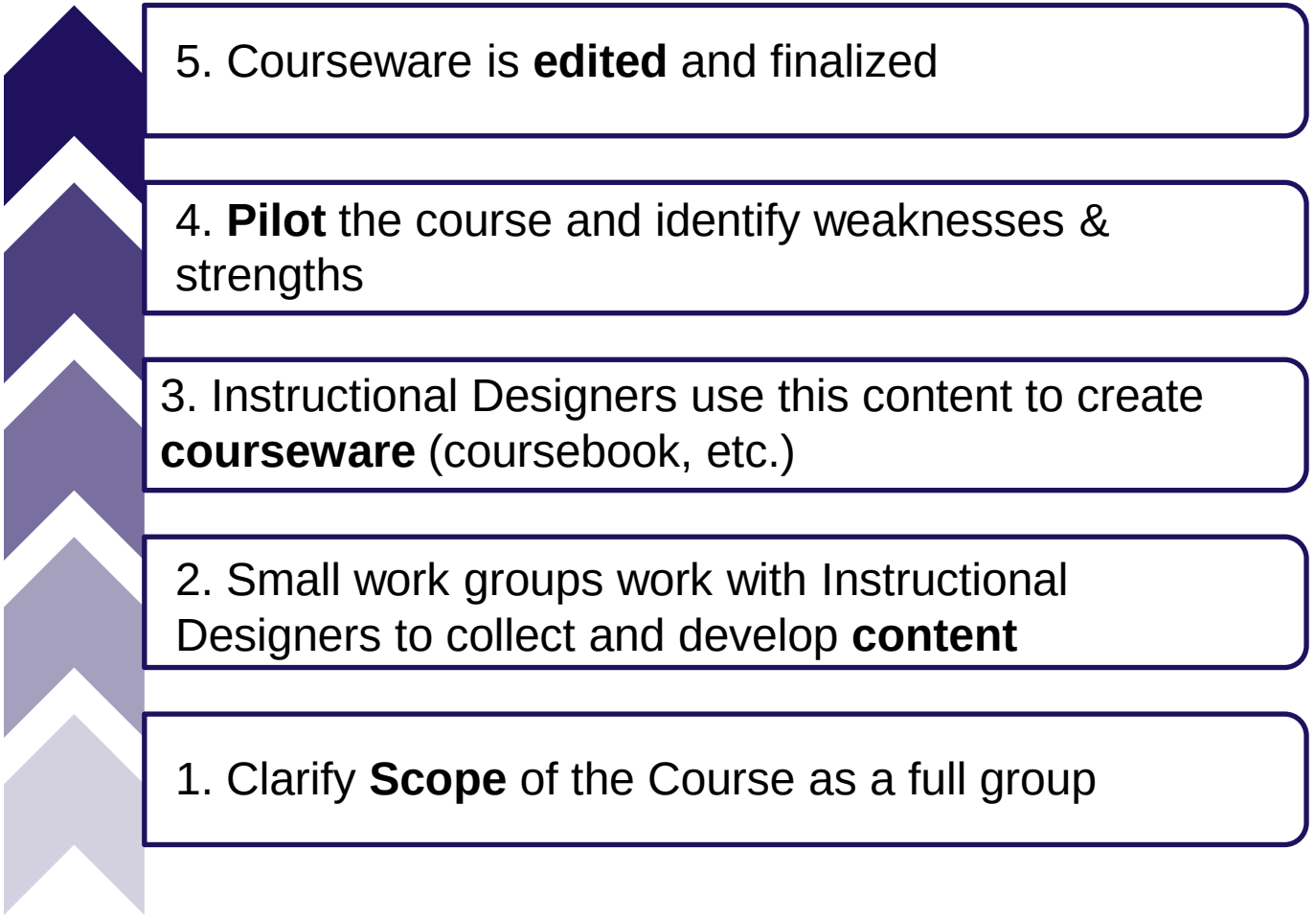
Added Value (continued)

- 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

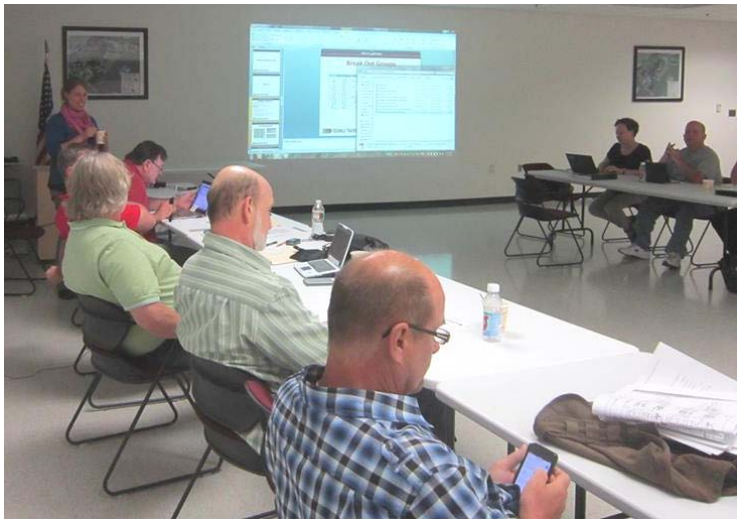
- Standards are a tool for instructional designers and instructors
- Developed by industry experts and users
- Continuously reviewed and updated
- Used by instructors and trainers to ensure minimum standards are met when curriculum is developed
- Can significantly reduce the time to create training classes

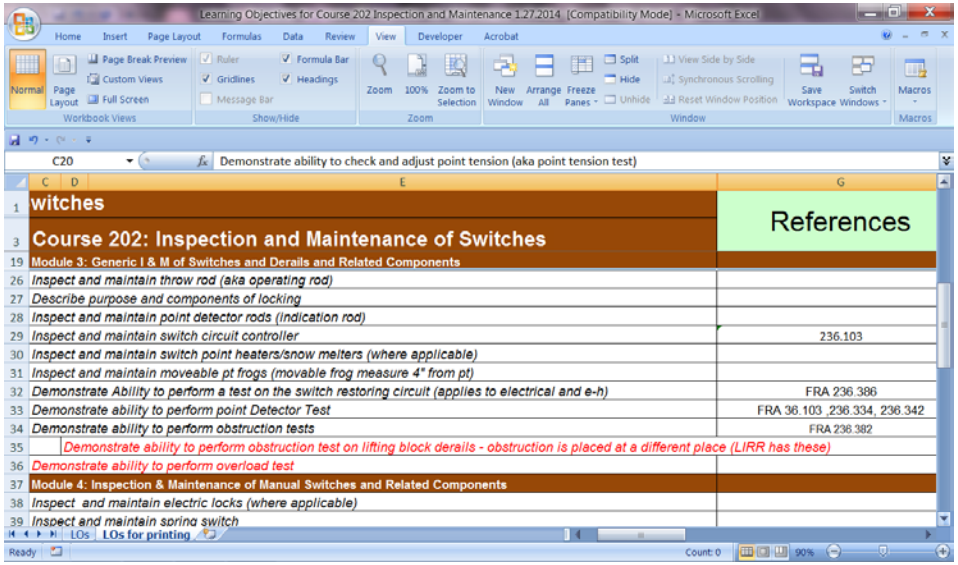
Courseware Development Process



1. Clarify Course Scope as Full Group

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





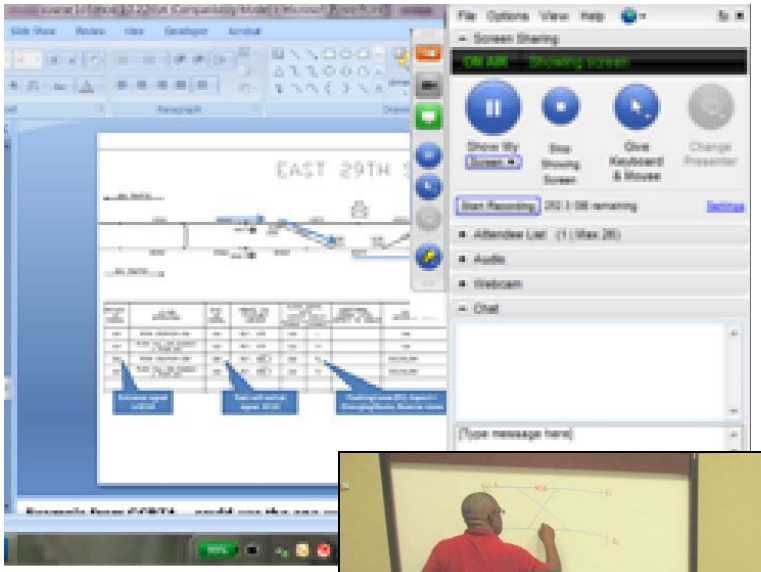
Learning Objectives for Course 202 Inspection and Maintenance 1.27.2014 [Compatibility Mode] - Microsoft Excel

C20: Demonstrate ability to check and adjust point tension (aka point tension test)

	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 Burnett	Fred Byle	Anthony Candarini	Brad Byrnes
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

S	M	T	W	T	F	S
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8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

JANUARY 2014

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26	27	28	29	30	31	

FEBRUARY 2014

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16	17	18	19	20	21	22
23	24	25	26	27	28	

MARCH 2014

S	M	T	W	T	F	S
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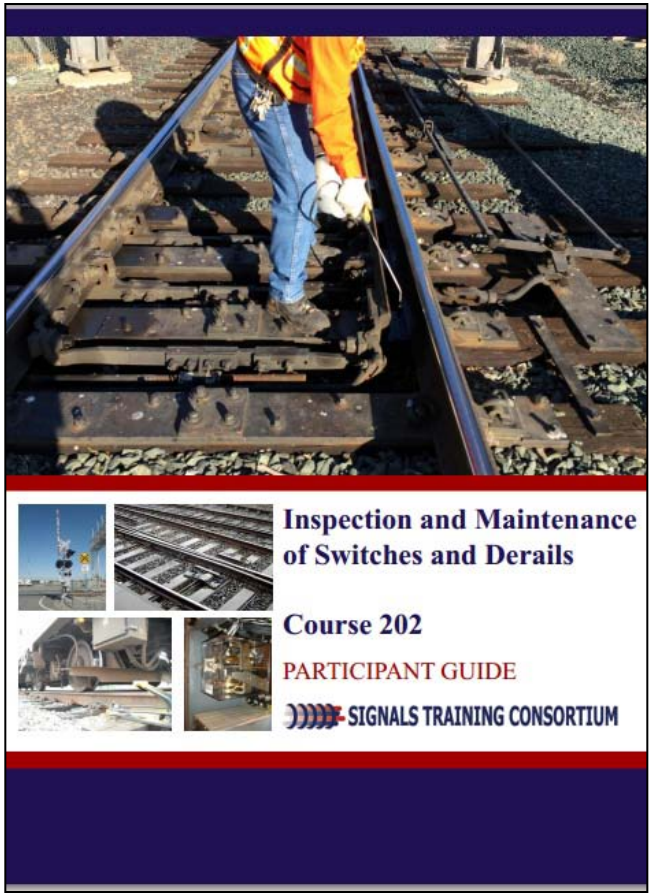
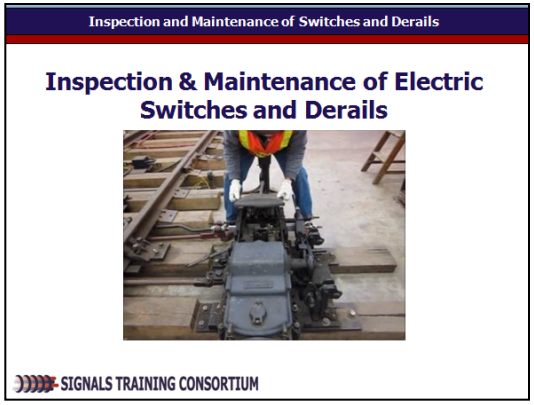
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

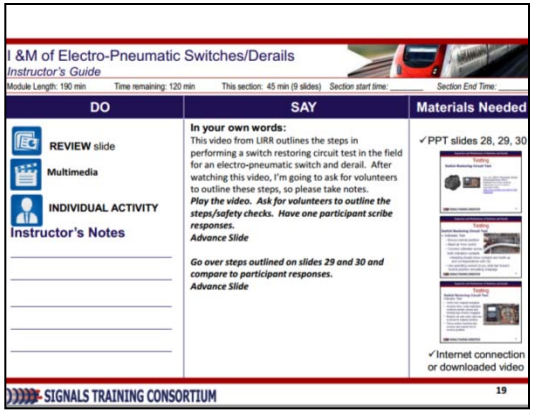
3. Instructional Designers turn Content into Courseware

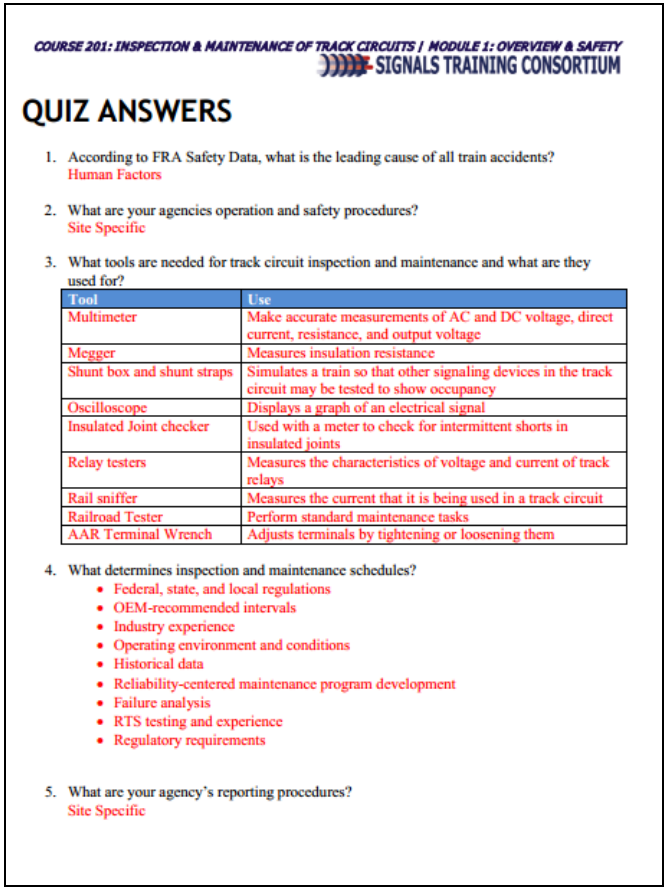
- Coursebook
- PowerPoint Presentations
- Instructor Guides
- Quizzes
- Videos

Signal Maintenance Courseware Example









COURSE 201: INSPECTION & MAINTENANCE OF TRACK CIRCUITS | MODULE 1: OVERVIEW & SAFETY

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QUIZ ANSWERS

1. According to FRA Safety Data, what is the leading cause of all train accidents?
   Human Factors

2. What are your agencies operation and safety procedures?
   Site Specific

3. What tools are needed for track circuit inspection and maintenance and what are they used for?

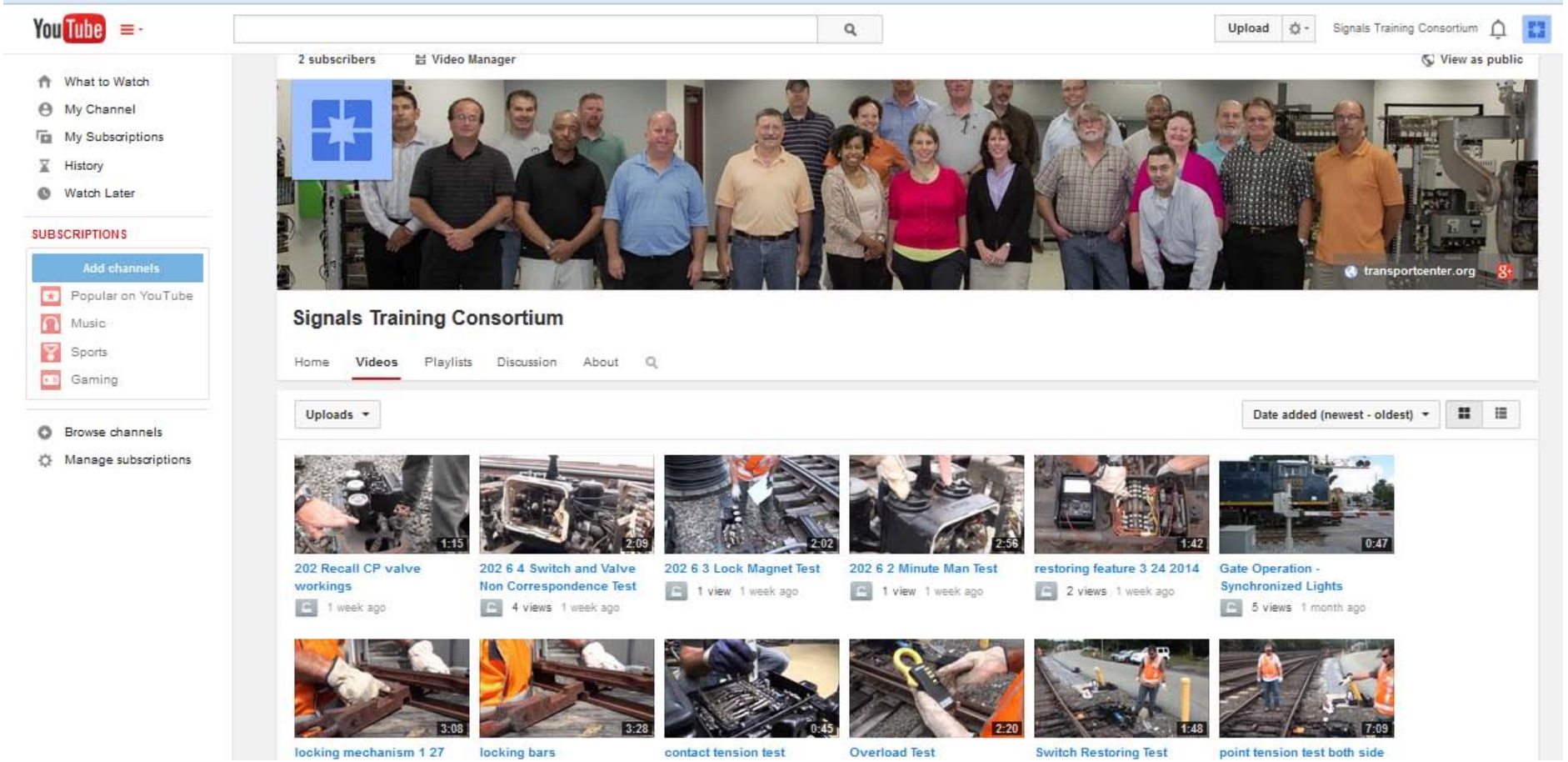
Tool	Use
Multimeter	Make accurate measurements of AC and DC voltage, direct current, resistance, and output voltage
Megger	Measures insulation resistance
Shunt box and shunt straps	Simulates a train so that other signaling devices in the track circuit may be tested to show occupancy
Oscilloscope	Displays 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

4. 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

5. What are your agency's reporting procedures?
   Site Specific

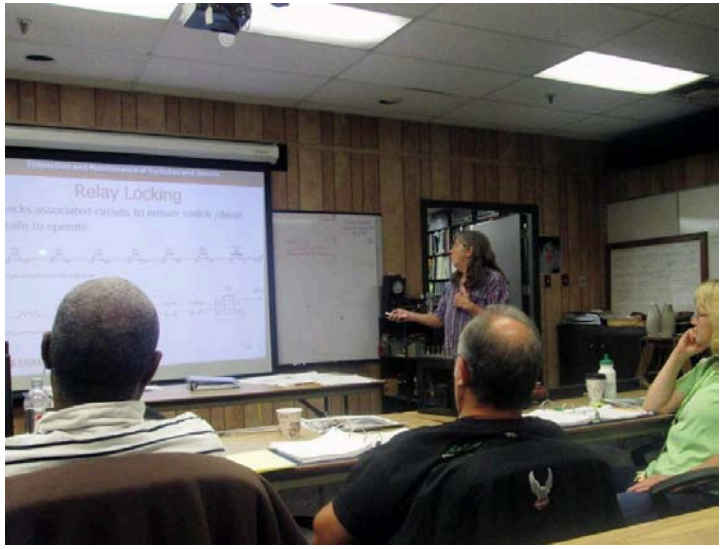
TRANSIT TRAINING NETWORK

Consortium Developed Videos



4. Pilots

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

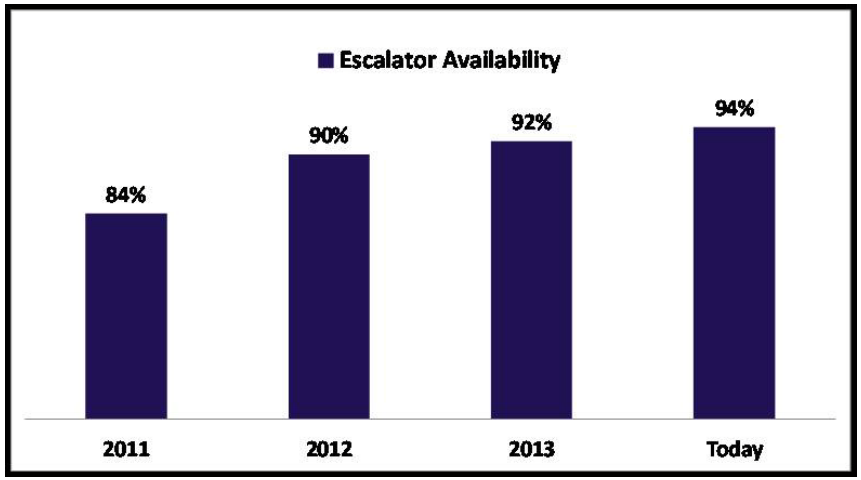


Pilot at MBTA

Evaluation – Return on Investment Transit Elevator/Escalator Example

El/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 El/Es Maintenance Costs



WMATA Increases Escalator Availability over Five Years

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5. Courseware is Finalized

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

Previews available at www.transittraining.net

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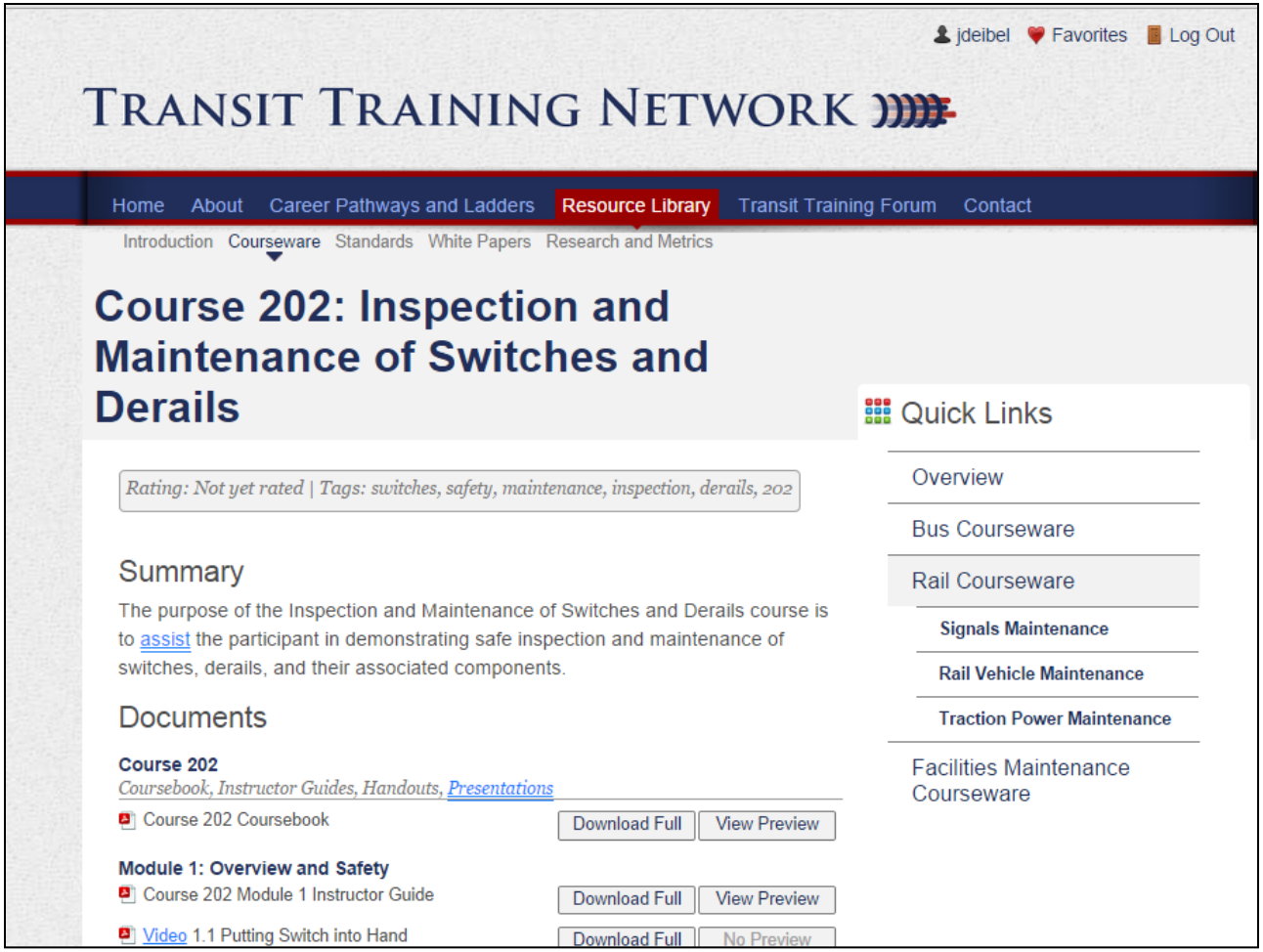
Transit Training Tutorial



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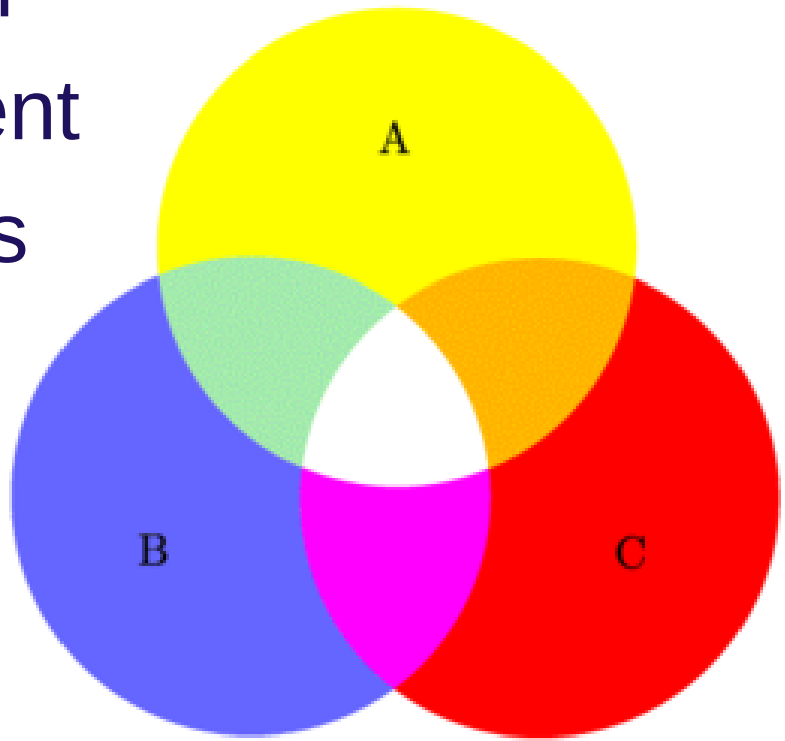
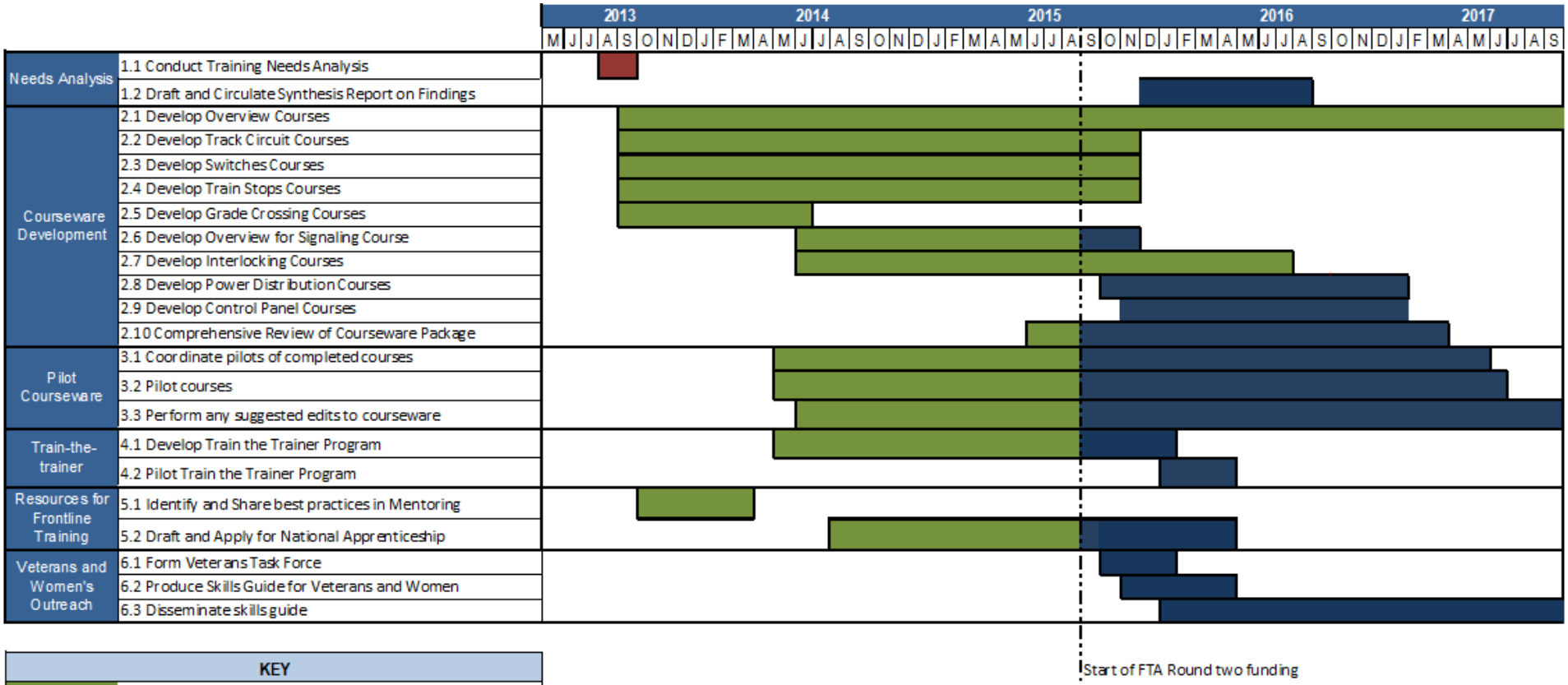
Finding Overlap

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



Work Plan & Deliverables



KEY
Complete
On Schedule
Behind Schedule

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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 Railroadway worker protection Safe train operation/expedited train movement Requlatory/requlations (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 *(Mike Monastero, Jim Lindsay)* • Review of Meeting Agenda • Review/Edit Breakout Group Discussion Guidelines	8:30
2.	Breakout Groups – Peer Review* • Cab & Wayside Signaling • Control Panels • Power Distribution	9:00
3.	Report back from small groups	11:00
4.	Breakout Groups – Address Peer Edits* • Cab & Wayside Signaling • Control Panels • Power Distribution	11:30
WORKING LUNCH		**1:00 PM**
5.	Report back from small groups during working lunch	
6.	Scope Update *(Mark)* • FTA funding • New Tasks • Documenting time and in-kind • Review Timeline/Progress	1:30
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**,
- Address **lack** of training at small locations and **supplements** training at larger locations
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Questions?