

RTA's 101st Conference Continues Centennial Celebration

Continuing its Centennial Celebration, the Railway Tie Association convened its 101st Conference & Technical Symposium Oct. 15-18, 2019, in Tucson, Ariz. The backdrop for the conference was The Loews Ventana Canyon Resort, which featured a breathtaking view of the Catalina Mountains and indigenous saguaro cactus in every direction.

Attendees participated in a variety of activities that inspired exploration of the area prior to the beginning of the business sessions. The business sessions brought

everyone together for updates on everything from economic and procurement issues to tie purchasing projections for 2020.

Kicking off the conference was a special presentation by Victoria Wilcox, the Georgia author of the year who penned the trilogy of books titled, "Southern Son: The Saga of Doc Holliday." Wilcox shared the story of the role railroads played in taking Doc Holliday from his home in Georgia to his adventures in the Wild West that have been memorialized in stories and movies for generations. ■



Big Boy, the largest steam locomotive in the world, made a stop in Tucson while RTA was convened for its conference. It is the Union Pacific's Big Boy No. 4014 and is 133 feet long, 17 feet tall and weighs 1.2 million pounds.

Annual Golf Tournament

RTA's Annual Golf Tournament, this year held at the Lodge at Ventana Canyon course, allowed golfers to enjoy a little friendly competition before the beginning of business sessions.



Josh Kmoch, Ted Woerle, Mary and Tim Ries enjoying the beautiful golfing weather!



This happy foursome included Zach Dombrow, Joe and Luke Reardon, and John McGinley.



Someone, as in Kristine Storm, is having fun.



John Reaves concentrating on his putt as Kevin Hicks inspects it and Rob Underwood and Mike Mancione look on.



Chuck and Annette Ludwig with James and Jim Renfroe.



Ted Pollard sinking a putt while Howard Tomlinson, Matthew Netterville and Bill Behan look on.



Kenny Dailey, with Michael Skeen to his left, smiling for our very talented photographer, Gary Coleman!



Jim Gauntt congratulates Tim Ries (left) for his great score.



Travis Gross, with John Giallonardo and Chase Armstrong, hopes to sink that putt.



Getting up-close-and-personal with Glenn Floresca.



Michael Brick, Ryan Richard, Sam Minton and Tony Mauricio.



Mike Luvin is ready to play.



The event gets a thumbs up from Jim Hansen and Herzog President Michael Mastio.



Wade Ostrander looks on as George Caric makes his shot.



Dave Berry and Dave Koch enjoy the after-golf lunch break.

Jeep Excursion Into The Sonoran Desert

Knowledgeable guides led participants of this tour through the plants, animals and history that make the Sonoran Desert unique. Along the way, they learned about the life of the giant saguaro cactus and visited a thousand-year-old Hohokam Indian occupation site.



Jeff Broadfoot gives the Jeep tour a thumbs up.



Susan Smith getting to know one of the local reptiles.

A Thing Of Beauty, A Joy Forever & More Fun

Other activities invited participants to enjoy unique experiences, such as making personalized jewelry using turquoise, agates and other gems; a tour of Tohono Chul Gardens and a private “Best of Barrio” tour.



All aboard for the Garden and Barrio Tours!



First-stop was the bakery on the fabulous food tour.



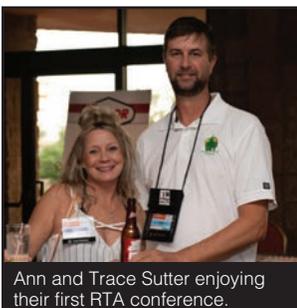
Lunchtime in the Tohono Chul gardens.



Andrea Kirkham showing off her new custom piece.

President's Reception

The Annual President's Reception is a great way to bring everyone together for a little food, drink and fun. The reception was held among the exhibit booths, allowing the group to explore new products and services.



Ann and Trace Sutter enjoying their first RTA conference.



Sue Peirson with Kathy Laughlin.

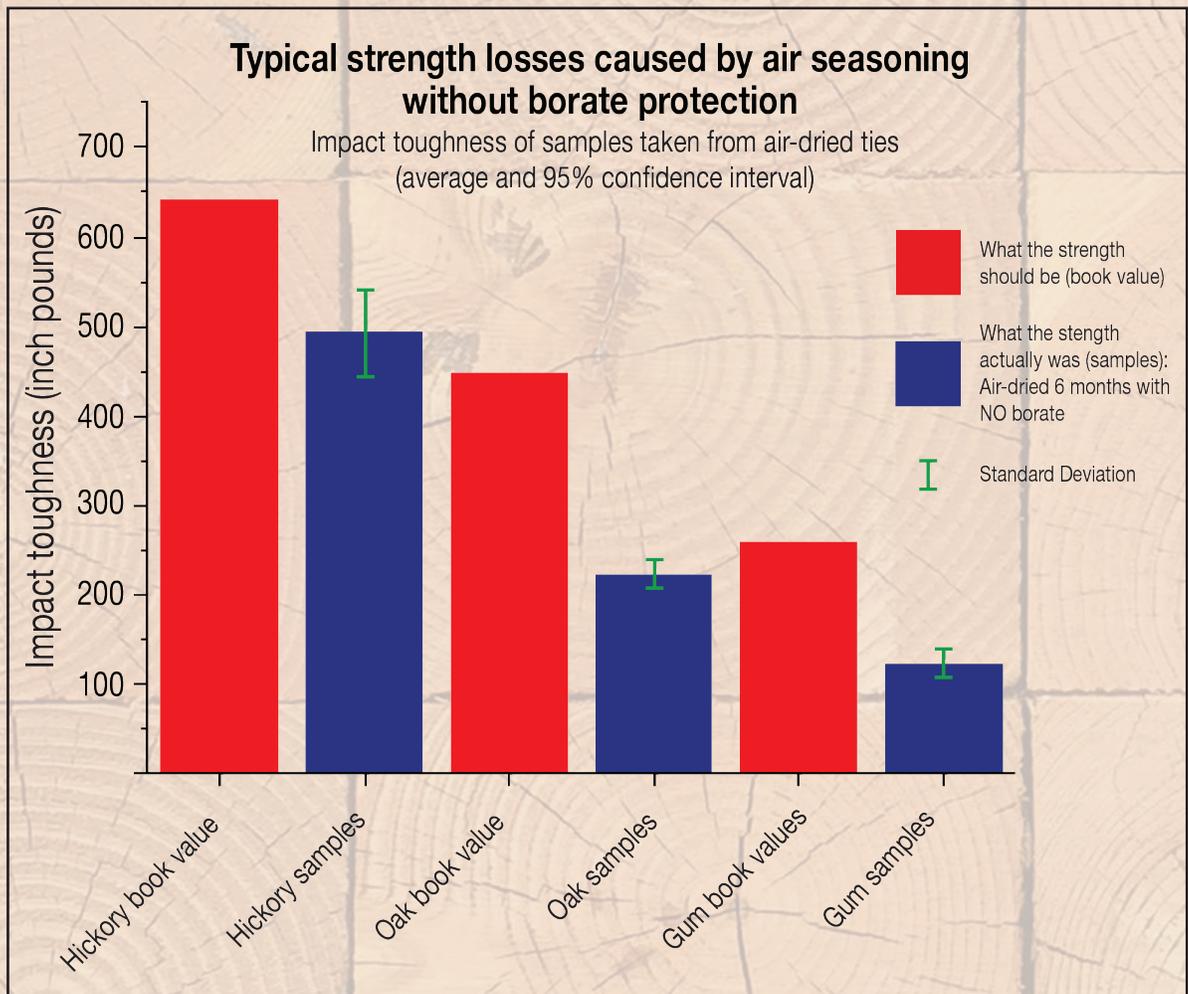


Tony Helms with Ken Peirson.



Jeff Miller, Jeff Broadfoot and Doug Mellott.

2-STEP TREATMENT WITH CELLU-TREAT® DOT BORATE WOOD PRESERVATIVE



The results of impact toughness samples taken from air-dried ties.

(Adam Taylor et al., 2013)

CONTACT:

KEN LAUGHLIN

Divisional Vice President, Wood Preservation
520-631-1084 • kenl@niscuscorp.com

CANON McDONALD

Eastern Regional Sales Manager
865-340-8408 • canonm@niscuscorp.com

TANNER FEE

Sales Representative
865-850-5103 • tannerf@niscuscorp.com

UNIVERSITY OF TENNESSEE - KNOXVILLE STUDY: AIR-SEASONED TIE COMPARISON

- Sweet gum ties air-seasoned as part of UT's 2-Step Tie Strength Study
- Half of the ties were dip-treated with Cellu-Treat® before air seasoning (2-Step Treatment); half were untreated.
- Ties were air-seasoned for six months.

CROSS-CUT SECTIONS FROM THE CENTER OF GUM TIES



TREATED

Gum tie 2-step treated with Cellu-Treat Liquid 50 to AWPA standard 0.25 pcf. DOT shows no decay.



UNTREATED

Gum tie not 2-step treated. The exterior appears to be OK, but internally, virtually the entire tie has suffered from decay.



www.niscuscorp.com
800-264-0870

Chart Source: Adam M. Taylor, Barbara Jordon, Jeffrey D. Lloyd (2013). *Pretreatment Decay, Strength Loss and Their Prevention in Railroad Ties*. Stockholm: The International Research Group on Wood Protection.
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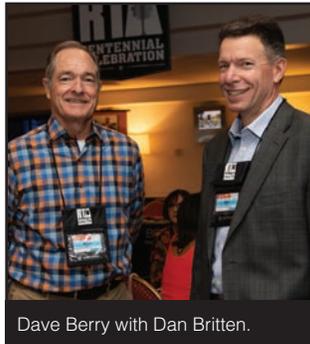
President's Reception



Joe and Christen Conway with Rick Embry.



Mike Lufkin with Shane Kitchens.



Dave Berry with Dan Britten.



George Apostolou with Jimmy Drakos.



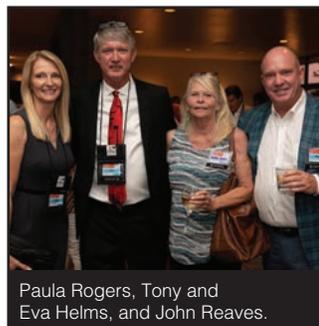
Tim Austin with Rachel Beck.



James Renfroe with Canon McDonald.



John McGinley with Nate Irby and Sue McGinley.



Paula Rogers, Tony and Eva Helms, and John Reaves.



Peder Arneson, Wes Piatt, Jim Gauntt and Carrie Arneson.



Vickie and Steve Basham with Misty and Brad Crawford.



Wade Ostrander, Genette Whitted and Jim Raines.



Matt Seal, Kristine Storm, Howard Tomlinson, and Mike McNail.



Kim and John Giallonardo.



Ken Jurgensmeyer looking over the old tie photos brought for the RTA 100th celebration.



David and Tina Caldwell with Tiffany Smith and Dana Cole.



Susan Tomlinson, Sue Peirson, Jeanie Downey and Sandy Miller.



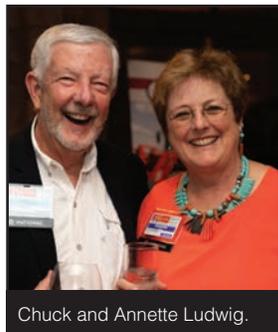
Heath Huschak, Gord Gilmet and Steve Smith.



Tim Tucker, Howard Tomlinson and Andy Andreykovich.



John Reaves, Scoot Sowell, Jennie Rahimzadeh and Luke Galan.



Chuck and Annette Ludwig.



Steve Basham with George Caric.



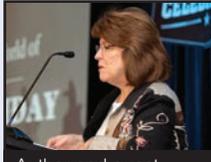
Ken Laughlin, Dick Keeley and Heath Huschak.

Thursday Morning Sessions

The first day of sessions starts early with RTA business followed by presentations on economic drivers affecting the railroad industry, procurement challenges and opportunities, engineering projects and more.



Michael Skeen kicks off the morning with a safety briefing.



Author and guest speaker, Victoria Wilcox, gives a special presentation on the history of Doc Holliday.



Tiffany Smith of Mayer-Brown helps to give the Economic/Trade Policy Session, along with...



...Tony Hatch of ABH Consulting/



Dana Cole moderates the Procurement Session with...



...Dr. Matthew Pelkki (from the University of Arkansas-Monticello).



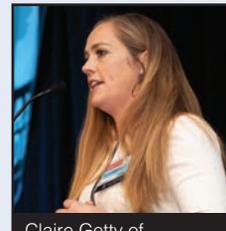
Joe Conway of Ozark Wood Fiber.



Craig Miller of Battle Lumber Co.



Tommy Battle of Battle Lumber Co.



Claire Getty of Thompson Appalachian Hardwoods.

Business Luncheon

This year's business luncheon included a keynote address from Genesee & Wyoming CEO Jack Hellman, a presentation by Christy Sammon of GoRail and Dallin Brooks of WWPI. These presentations were followed by RTA committee reports.



Stan Thomas had the honor of reading the Resolutions Report again this year.



Mr. Hellmann has everyone's attention as he delivers the keynote address.



Jack Hellmann, chairman and CEO of Genesee & Wyoming, addresses the luncheon group.



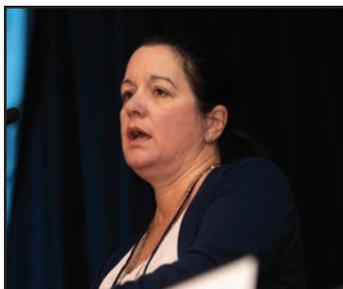
Dallin Brooks of WWPI discusses the California Disposal Laws.



Christy Sammon of GoRail gives an industry update.



RTA committee chairs give their reports. First up is Marshall Allen of the Education Committee.



Stacey McKinney of the R&D Committee.



Liz Russell of the Safety and Material Processing Committee.

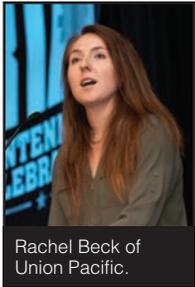


George Caric of the CLEAR Committee.

Thursday Afternoon Sessions



Ed Sparks of CSX Transportation and AREMA president gave the annual update.



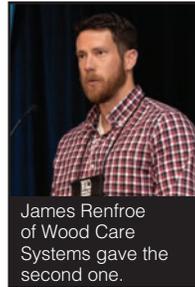
Rachel Beck of Union Pacific.



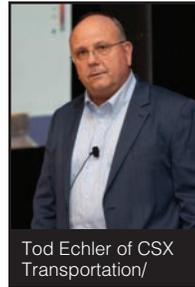
Dean Dalquist of BNSF.



Mike Goldston, president of Brewco, gave one of two "vendor-mercials."



James Renfro of Wood Care Systems gave the second one.



Tod Echler of CSX Transportation/



Stephen Smith of Stephen Smith Consulting closed out the very full day of presentations.

Awards Reception

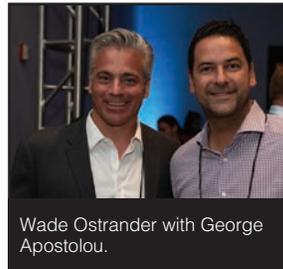
A change from the typical formal banquet-style format was on tap for this year's Awards Reception, where attendees learned about RTA Award winners and scholarship recipients and enjoyed a variety of tapas.



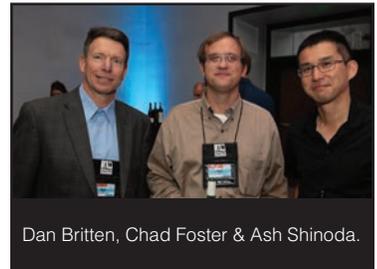
Koppers folks are catching up with each other.



Looks like there is a new sheriff in town! RTA's Barbara Stacey knows how to get into character.



Wade Ostrander with George Apostolou.



Dan Britten, Chad Foster & Ash Shinoda.



Dave Koch with Mike McNail and Matt Seal.



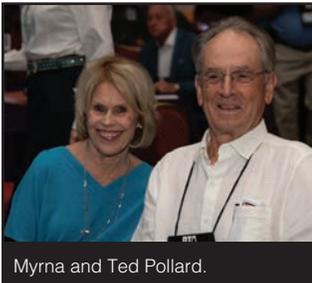
Rob Underwood



Michael Brick with Anthony Weiss.



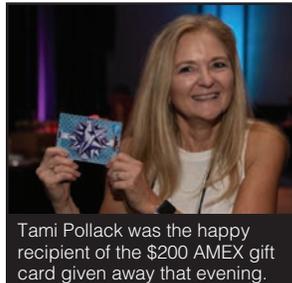
Sue Peirson with Liz Russell.



Myrna and Ted Pollard.



Tod Echler was one of the lucky winners of the beautiful wood RTA cutting boards given away at the reception.



Tami Pollack was the happy recipient of the \$200 AMEX gift card given away that evening.



Desiree and Dean Dalquist with Susan Gauntt (center).



Branding Hammer Award Winner, Tod Echler with Bill Behan.



Buddy Downey accepting the Broad Axe Award from Bill Behan.



Winners of the Silver Saw Award, Craig Miller and Tommy Battle of Battle Lumber Co.



Dave Barry accepting the William T. Moss Supplier Award from President Bill Behan.

Friday Sessions

Attendees were briefed on a variety of R&D projects addressing topics such as dermal absorption when coming in contact with creosote to wood tie life expectancy and more. Research topics were followed by the always popular Railroad Purchasing Forum, where numerous Class 1 railroad purchasing professionals provided their projections on tie purchases for 2020.



The morning started with Matt Konkler of Oregon State University.



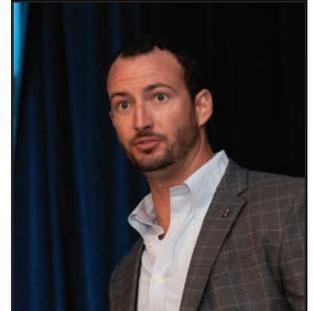
Nick Skoulis spoke on behalf of the Creosote Council.



Maureen Hodson (right) and Monica Meyer of EHS Support.



Antonio Mauricio of Georgetown Rail and...



...Sam Minton of BNSF gave a joint presentation.



Bob Fronczak of AAR gave an update.



Dr. Michael Liesenfelt, also of Georgetown Rail, was on the Research Session Panel.



Dr. Tim Young from the University of Tennessee was the final speaker for this session.



Kristine Storm of G&W is ready to start moderating the Railroad Purchasing Forum.



Erin Carson of CSX Transportation.



Anthony Weiss of BNSF.



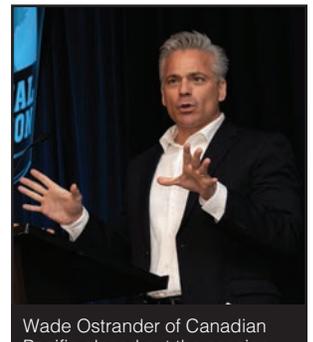
Nate Irby of Union Pacific.



Bill Blaise of Kansas City Southern.



Maya Ramadan from Canadian National.



Wade Ostrander of Canadian Pacific closed out the session and the day.



Nick Mood of National Salvage was the lucky winner of the EHS Support drawing.



Bruce Hobbs and Jeff Broadfoot were the lucky winners of the RTA app game that had some pretty high-scoring participants. They each received one of the RTA Centennial wooden cutting boards.



Giallonardo was the winner of the \$300 AMEX gift card sponsored by Canadian Pacific.



Just before the end of the conference, RTA Executive Director Jim Gaunt and his wife, Susan, were presented with a crosstie "keepsake" for his retirement and 25 years of service to the association.



Those past presidents in attendance at the conference gathered with Jim and Susan to take a photo with his gift.

Exhibitors & Sponsors

The 101st RTA Conference & Technical Symposium would not have been possible without the support of our exhibiting vendors and sponsors.



Tim Austin, Dave Berry and George Apostolou with the Lewis Bolt & Nut Co. exhibit.



Barry Black with Taylor Machine Works.



Canon McDonald and Ken Laughlin with the Nisus display.



Morning speaker and author, Victoria Wilcox, with her Southern Son Series.



Mark Bear of the National Hardwood Lumber Association.



David Woodard and Frank Forlini at the Omaha Track exhibit table.



Tim Carey at the Lonza tabletop.



Mike Goldston of Brewco speaks with Tim Francis at his exhibit.



Jason Sears at the Embry Automation & Controls exhibit.



Wood Care Systems tabletop exhibit.



National Salvage & Service table.



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EHS Support

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Conference Speakers Offer Insight On Industry

Experts from all facets of the railroad and wood tie industries made detailed presentations during RTA's 2020 Conference and Technical Symposium, held in October in Tucson, Ariz. They discussed topics ranging from economic issues driving the rail industry, procurement challenges and engineering projects to the latest in research and development and expectations for tie purchases for 2019, 2020 and beyond.

Victoria Wilcox, Author of *Southern Son Trilogy*

Without the railroad to bring new settlers to the American frontier, to ship out silver, gold and cattle and to carry out furniture, the frontier would have remained and John Henry Holliday—Doc Holliday—the West's most Southern gentleman, would not have become a legend. The rails helped Doc Holliday become a Western legend.



ECONOMIC/TRADE POLICY SESSION

Tony Hatch, ABH Consulting

Freight rail invests six times more than the average U.S. manufacturer. This is an expensive business, and the key is what you're getting in return for spending. The rail industry now earns its cost of capital. ROI is crucial. If it is above the cost of capital, they can spend more money, have a stronger physical plant, and have more and better equipment.



Tiffany Smith, Mayer-Brown LLP

We are hearing that the Chinese want to remain engaged in tariff negotiations. A planned increase for October has been put on hold. Another batch of tariffs are supposed to take effect in December and have not yet been withdrawn. Part of the strategies of tariffs is to move manufacturing out of China.



PROCUREMENT SESSION

Dana Cole, Hardwood Federation

We are losing markets over in China. In



2017, we were 31 percent of the hardwood market in China. In 2019, we are about 18 percent. A couple of markets, such as Russia and Gabon, are expanding. Why is trade hard? Decisions are made at the very highest levels of the government, including the president himself. There are constant changes to the status quo, and limited powers lie with Congress. Many agree with the "get tough" position. What can we do to help? Become engaged and get involved.

Dr. Matthew Pelkki, University of Arkansas-Monticello

Trees as a resource are vibrant, healthy and growing more than it is being harvested. We can't keep packing biomass into our forests. Either it will need to be turned into wood products, or we will see our forests go up in fire. Hardwood lumber market difficulties increase the importance of the tie market.



Joe Conway, Ozark Wood Fiber

In 2019, the positive is the market demand for crossties, pallet cants, board and road mats, and pipeline skids. There is improvement in residual markets. The negatives are export lumber constraints, domestic lumber constraints and in the first half of 2019, rising log prices. Going forward, we could see a 20 to 30 percent reduction in sawmill producers if there is no trade agreement until after the 2020 election.



Tommy Battle & Craig Miller, Battle Lumber Company

We ship all over the world, exporting grade lumber to more than 19 countries across the globe. We have cutting-edge sawmills and equipment, and are in the process of a major expansion. Right now, the hardwood industry is in a bad state of affairs. Our Red Oak is made to go to China, and they stopped buying, so we had to start thinking about other things we could do. We started making a lot of ties and looking at other industrial products.



Claire Getty, Thompson Appalachian Hardwoods

I am a third generation owner of a hardwood sawmill, and I get to work at Thompson Appalachian Hardwoods with three of my siblings, my parents and 125 other terrific employees. We have found that by raising wages we are attracting people who didn't realize that you could make a good living in the forest products industry.



BUSINESS LUNCHEON & KEYNOTE ADDRESS

Jack Hellmann, Genesee & Wyoming

In early July, we announced the sale of the Genesee & Wyoming to Brookfield Infrastructure Partners and GIC that is expected to close late 2019 or early 2020. The acquirers' long-term investment horizons perfectly aligned with the long lives of G&W's railroad assets, which are integral to the local economies that we serve in North America and around the world. They are also fully supportive of our business plan, which will continue to be focused on safety, customer service, and growing our footprint to provide more opportunity for our people.



Christy Sammon, GoRail

GoRail works with thousands of community leaders across the country to tell the local story of freight rail. The story is that freight rail creates stronger economies, more jobs and cleaner skies. We work mostly with Class 1 railroads and also with short lines. Smart freight policies power economic growth, protect infrastructure, provide capital needed to meet future freight demands, and preserve current balanced economic regulations that allow railroads to reinvest.



Dallin Brooks, WWPI

There is concern about treated wood waste generated by our infrastructure, including utilities, railroads, ports, highways, parks, agriculture and construction. The concern comes from the environmental



impact of the volume going into landfills, water quality, and the volume going to biomass burning and the potential volume of pollutants in the air.

COMMITTEE UPDATES

Marshall Allen, Education Committee

This committee administers the John Mabry Forestry Scholarship and the Annual Tie



Grading Seminar and other events. Scholarship applications are due by June 30. Each winner receives a \$2,000 scholarship paid in equal amounts over two semesters. The Tie Grading Seminar this year was held in Hope, Ark., and this was the first time we've had a sitting RTA president as a student.

Stacy McKinney, R&D Committee

We are a pretty active group with more than 35 members who actively participate. In a



meeting we had last Tuesday, about 20 people showed up in person. The committee's Tie Recovery Task Force is dedicated to finding out how to make tie recycling profitable by finding a sustainable solution.

Liz Russell, Safety & Material Processing Committee

Our committee is best known as the sponsor of the Annual RTA Field Trip, a three-day,



intense tour of multiple facilities throughout the region. This year, the trip was to visit the Texarkana area, where we had the opportunity to participate with the Hardwood Manufacturers Association during their annual tour in the same region. We also write articles for *Crossties*, most recently discussing the do's and don'ts of safely loading and unloading center beam railcars.

George Caric, CLEAR Committee

Please mark your calendars for March 4, 2020, to attend the annual Railroad Day on the Hill event in Washington, D.C. We need to be present in meetings with legislators to lend our voice to the importance of the rail industry.



CLASS I ENGINEERING & ENVIRONMENTAL FORUM

Ed Sparks, CSX & AREMA

AREMA has seen exponential growth in the number of student chapters, with 24 now located across North America. We have seen greater student involvement at annual conferences and have specific events tailored to the next generation. We are seeing strong member and industry support for the AREMA Educational Foundation. Regarding CSX, we are looking at new treatment for oak being copper naphthenate and borates. We are also trying to make a dent in productivity with panelization.



Rachel Beck, Union Pacific

While we install primarily wood ties in track, we are always looking toward the future and what improvements can be made. Accelerated decay and poor treatment are an issue. Another concern with wood ties is availability. We have been installing dual-treated ties since 2008. Since 2015, all of our ties within high-decay zones are borate treated. Original installations continue to show no signs of significant leaching, a strong boron presence, consistent density levels and no excessive decay or mechanical defects.



Dean Dalquist, BNSF

Over the past 20 years, we've spent \$67.3 billion in capital investments. In 2019, we spent \$3.6 billion. In 2018, it was \$3.4 billion. This year, almost 70 percent of our capital investments go into rail ties and ballast—12,000 miles of surfacing, 535 miles of rail, and 2.3 million ties replaced. BNSF is safer than ever. The infrastructure is in the best shape ever. We have continued with capital investment using data-driven precision.



Tod Echler, CSX

We're going to continue to be at the 3 million ties mark. We are doing a lot of yard work, and will go into our yards more next year. We did not run out of ties this year, and my procurement department says we're not going to. We are thinking



about going 100 percent copper naphthenate on bridge ties. What's next to increase the useful life of wood crossties?

Stephen Smith, Stephen Smith Consulting

The benefits of creosote-treated wood are wide. Generally, I categorize the benefits as economic, societal and environmental. Forestry contributes 2.8 million jobs, a \$102 billion payroll, \$262 billion in sales, 6.68 percent of manufacturing base. Most creosote-preserved wood products last as long as is needed for new trees to grow. And they become a renewable fuel at the end of their service life.



RESEARCH SESSION

Matt Konkler, Oregon State University

Creosote-borate dual treatments are commonly used to extend timber life. In this study, nine 3" x 3/4" rods were placed 13 inches apart in bore-holes in 10x10x10' green bridge timbers before creosote treatment. With the moisture content high, the rods dissolved rapidly—four to six weeks, possibly faster—with the boron diffusing rapidly in a longitudinal direction.



Nick Skoulis, Creosote Council

Creosote is under re-registration with the U.S. EPA. The EPA recommended certain improvements in environmental control systems to diminish any exposures based on a 2001 study. The Creosote Council conducted a study the facilities enacted engineering controls and evaluated exposures to determine if exposure had been decreased as hoped. In vivo dermal absorption in rat skin was 8.4 percent. In vitro dermal absorption in human skin was 4.2 percent. While certain materials in their 100 percent state may be very toxic, residues across wood and toxicities are greatly diminished. Sometime in the third quarter of 2020, the testing should be complete.



Maureen Hodson & Monica Meyer, EHS Support

A focused effort is required in implementing a solid EHS program. On the whole, we



Hobson

want to emphasize that although there are a lot of health and environmental safety issues, this can be managed in house using current resources. The best way to get a handle on this is to analyze your issues and then prioritize your efforts in tiers.



Meyer

Sam Minton, BNSF & Antonio Mauricio, Georgetown Rail

The GREX system has been pivotal in making BNSF's replacement program data driven. BNSF is 80 percent wood ties, and we like our wood ties. Aurora Tie Inspections allow us to perform consistent tie replacement based on data. We scan about 10,000 miles per year using two to four trucks. Surface scans identify mechanical and surface failures. XI identifies internal failures, rot and decay. BNSF's infrastructure is in the best shape ever. Our capital investment continues to be strong. Our smarter, data-driven maintenance program is driving efficiencies.



Minton



Mauricio

Robert Fronczak, AAR

AAR, the Treated Wood Council, and the American Forest & Paper Association filed a petition for rulemaking on Dec. 7, 2018, asking the EPA to eliminate the design to burn criteria from the non-hazardous secondary materials rule. A meeting was held with the EPA General Counsel Matt Leopold in July to discuss the legal argument. There was no objection from the attorneys at the meeting to the argument. The next step is to set up a meeting with EPA staff to determine whether a rulemaking can be initiated to eliminate the design to burn criteria.



Dr. Michael Liesenfelt, Georgetown Rail Equipment Company

Artificial Intelligence will eventually combine both surface and internal data streams. It will be amazingly accurate when trained on large, diverse datasets. Progressing into the future does not mean human experts will disappear. Artificial Intelligence systems have the capability



to do tremendous things. They are very good, but we can achieve the same level of accuracy only because humans are involved. If we pass 1,000 ties through the system, there are a few that will be anomalies. Those get to be kicked out. The human will take 10 ties off to the side, chainsaw them, tear into them, and figure out why a tie was an outlier and feed that result back into the system.

Dr. Tim Young, University of TN

There are a lot of opportunities to improve processes that are already in place by using a little bit of data in the right context. If you don't measure data, you can't improve it. If you measure it, it helps sustain the effort. You cannot improve any process you cannot accurately measure. Statistics in the right context can be very helpful.



PROCUREMENT SESSION

Kristine Storm, G&W

Our 2019 capital investment in infrastructure is \$348 million, with more than \$1.5 billion invested in the past five years. Ties represent 40 percent of the capital spend allocation. Our 2020 crosstie program calls for 1 million wood crossties, 750,000 board feet of switch timbers, 1.5 million board feet of bridge timbers, 150,000 board feet of crossing timbers and 3,000 steel ties.



Erin Carson, CSXT

We didn't run out of crossties this year, but it was really, really close. For 2019, we are planning to end our year at 3 million ties. For 2020, we expect to maintain 3 million. Branch line ties will continue to be a large part of our program, with a minimum requirement of 20 percent for 2020.



Anthony Weiss, BNSF

In 2019, we will spend \$3.56 billion for maintenance and expansion. BNSF has made nearly \$65 billion in capital investments in our railroads since 2000. It's essential we continue to expand to have the right resources for our customers. This year, we will spend \$2.47 billion on maintenance, including 12,000 miles of track/resurfacing/undercutting; 535 miles of rail replacement;



and 2.3 million ties replaced. Our tie program for next year is 2.8 million installed.

Dr. Nathan Irby, UP

Our Unified Plan 2020 calls for us to focus on moving cars and driving more efficient, reliable and predictable levels of service for our customers. Our estimated demand for 2020 is 3.7 million wood ties and 200,000 concrete ties. Our large capital plan of \$3+ billion, the largest portion going into infrastructure, is a testament to our investment into the business and our future. We greatly appreciate all of our suppliers and their hard work and dedication over the year.



Bill Blaise, KCS

In order to provide good service to our customers, we need to have good infrastructure to run on and, thus, continue to invest in our network. It is critical to remain successful with 44 percent of capex spent on maintenance: rail, ties, etc. Ties represent 16 percent of our maintenance spend. This may fluctuate a little bit in the future. This year, we expect to end at 535,000 new wood ties, and 2020 will be very similar. Our business will grow in the future, and growth will require more ties.



Maya Ramadan, CN

Our 2019 capital investment spend is \$3.9 billion. We have 65 million wood ties installed in our track. Our demand is for 2 million ties in 2020. We plan to install 1.8 million crossties, 80,000 switch and pre-plated ties; and 100,000 concrete and composite ties for a total of 2 million ties, system-wide.



Wade Ostrander, CP

Our new tie program calls for 1.2 million ties. Track time is at a premium. We expect to install 8,000 concrete ties and 30,000 switch ties. Our initiatives include industry benchmarking, process improvement, cost-savings and efficiencies, inventory management and scrap tie recycling.

