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Data & Monitoring

Esri

Esri Summit Showcases the Benefits of GIS to the Rail Industry
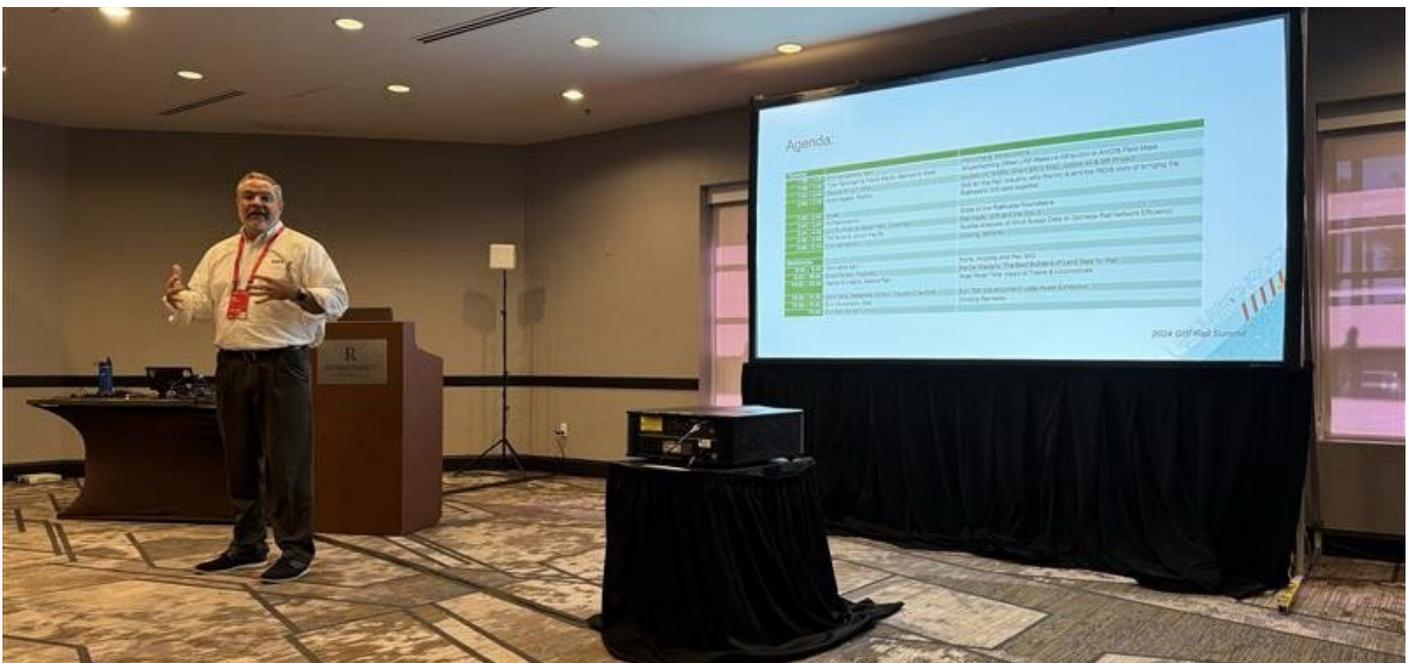
Esri's annual GIS Rail Summit showcased the many ways US railroads are benefiting from geographic information systems.

Esri, a leader in geographic information system (GIS) technology, recently held its annual GIS Rail Summit as part of its IMGIS Conference in Palm Springs, California.

This two-day event brought together railroads, transit authorities, associations and vendors to share knowledge and their experiences implementing GIS solutions.

Attendees included Utah Transit Authority, OmniTrax, Amtrak and Conrail, all of which participated in Esri's 'State of the Railroads' roundtable session.

The summit was arranged and opened by Erik Henderson, ESRI's Director Rail Industry Solutions, who then welcomed speakers to the stage to discuss the GIS projects they've been involved in.

First up was Bartlett & West Software Developer, Trevis Martin. He presented the work his team is undertaking to improve linear reference system (LRS) functionality for mobile users. Railroads often use many different systems and methods for recording information about field assets, but the accurate milepost value and engineering station values are difficult to obtain when standing in the field, so they created the functionality to identify your location along a measured line to obtain these values. This will help inspectors to more accurately record incidents in the field as well as to correctly identify areas of concern.

Other presenting vendors included Cybertech and ReportAll. The former addressed concerns around data security and how cloud-based security is becoming more accepted, while the latter discussed how organisations' real estate portfolios are like Lego, in the sense they're made up of a lot of different pieces.

"They offer their parcels in many different ways, also like Lego: they have mobile access, streaming services and an API to connect to," Henderson explains. *"They're constantly connecting with parcel maintainers like cities and counties for updates and refreshes to always provide the most up-to-date information."*

FRA Provides NARN Update

It was also great to hear from Federal Railroad Administration (FRA) representative Raquel Wright about how the organisation is continuing to improve the North American Rail Network (NARN). The administration recently signed an MoU facilitating a more seamless exchange of railroad data and information, and GIS Program Manager Wright outlined a new storymap about the FRA and US Department of Transport (DOT) Corridor Identification and Development (CID) Program to advance new and enhanced intercity passenger rail corridors and support long-term development in communities across the country.

Wright was followed by Railinc GIS Manager Brent Kastor, who talked about what most railroads understand as their function, maintaining the Station Master and handling all of the electronic data exchange (EDI) messages generated from automatic equipment identification (AEI) sites nationwide. They also receive station embargos from railroads when certain stations have to be shut down, mentioning the recent hurricanes

and the effects they have had on rail which have caused several station embargos. His session ended with information on their other services, such as AskRail and Clearpath.

How Railroads Are Using GIS

It was also great to hear the experiences of those on the ground, and how they've used GIS to create solutions for their specific needs. Take Alaska Railroad for example, which has to deal with extremely remote environments, with large distances between its cities and towns.

There was a need to have better visibility of its locomotives and trains, and so the railroad's GIS Program Manager Garret Giordano created a new tool, the Rail Radar, to provide a near real-time view of its vehicles.

"He's had a great response to the app so far and has added lots of requested info like weather, earthquakes and stream gauges," Henderson says. *"He'd like to add real-time arrival estimates for passengers at stations and make the map outward-facing in the future. Very unique to Alaska is that the railroad doesn't connect with any other railroads and receives all of its cargo via barges at several ports."*

Over at Union Pacific, Tim Boland, Senior Manager, Engineering Infrastructure has been working on a project to analyse the risk of high wind speeds on the network that can cause train derailments. Through his maps and analysis, he was able to identify what locations had the highest probability of winds in excess of 55mph. He was also able to identify that the winter months had historically produced the highest winds.
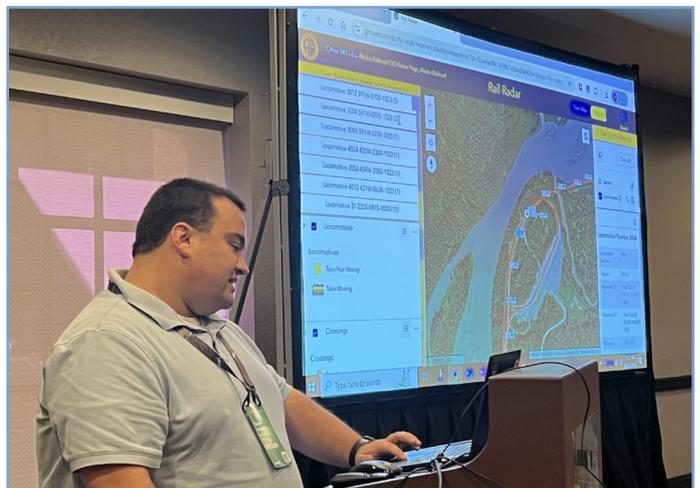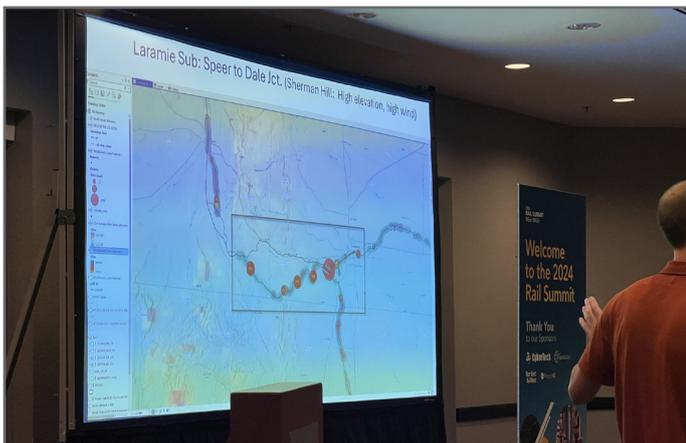
Ultimately, he was able to create business rules about rail operations in those high-risk routes during the peak hazard seasons.

Esri Product Team Takes to the Stage

As you'd expect, Esri's 3D GIS team also presented at the summit, and Lee Brinton, Senior Product Manager – 3D Analyst and Point Cloud workflows, discussed many of the products his team offers.

"Much of the team's work is about helping customers to better represent their areas of responsibility in the most realistic version they can. Our world is in 3D so people are getting used to seeing their data in 3D as well," Henderson says.

Brinton talked about the great work that's been done with the City of Zurich's Digital Twin for example, where they're modelling water flow to help municipalities identify where's at the greatest risk of flooding in the event of heavy rainfall. He used this opportunity to discuss with the railroaders what other types of flow would be helpful for them to model, and one of the ideas that came up was avalanches in Alaska.

While perusing the Esri giftshop during the Esri IMGIS Conference, Union Pacific's Tim Boland and Aaron Brown discovered that their map was chosen as the cover of the latest edition of the Esri Map Book.

"I actually worked on the project with them at my last job prior to Esri, so it was great to buy them each a copy to say thanks," says Erik Henderson, ESRI's Director Rail Industry Solutions.

"Esri's Founder, Jack Dangermond was also there, so I walked up to him and introduced them as the creators of the map. It was a very cool moment, as Jack had handpicked their map as the cover art, so was very excited to meet them!"

The ability to build 3D models of the weather itself to better represent things like wind, was also discussed. Finally, Brinton showcased that Esri has created a new compression file type, zLas, which can compress lidar data up to four times more than regular LAZ files. The team is now looking to partner with railroads to learn what new types of tools, storage and displays are needed with lidar data and is asking anyone willing to share their data, so that the team can continue to develop their tools.

For more information visit www.esri.com or contact one of the team