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Digital Transformation and the Mass Transit Industry



SOLUTION BRIEF



Digital transformation brings the power of automation and data analytics to mass transit rail systems.

Mass transit systems present challenges. Their complex infrastructure, high user concentrations, and broad geographic scope **demand robust solutions**. Riders expect comfort, on-time performance, and safety – at a minimum. Modern riders want seamless connectivity and data security, too.

Belden's Connected Rail Solution provides everything you need to meet these demands.

Designing the Connected Rail System for Mass Transit

Belden helps you design, install, and validate the bandwidth for large amounts of data, the redundancy for reliable performance, and the cybersecurity to protect against service interruptions and data theft.

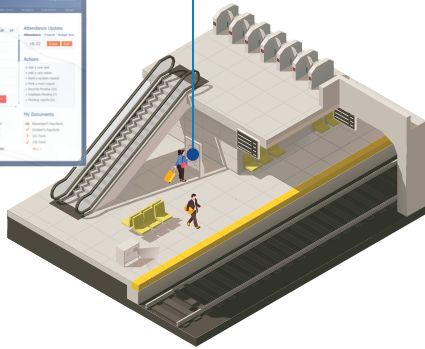
Each of rail transit's top five operational imperatives are considered while creating the solutions to address your challenges and enhance your operational efficiency.

LABOR PRODUCTIVITY

WORKFORCE MANAGEMENT SYSTEMS

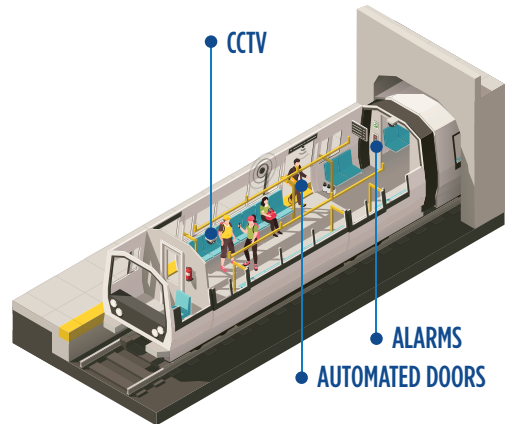


AUTOMATED OPERATIONS



PASSENGER SAFETY AND SECURITY

CCTV

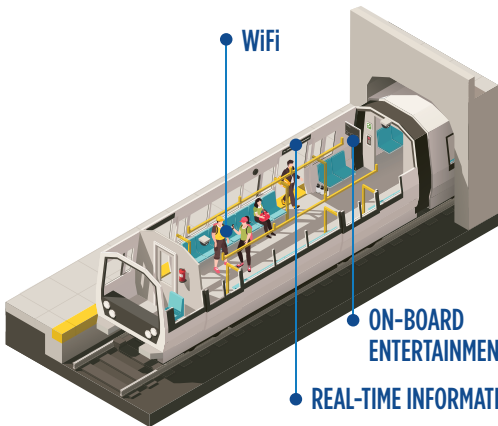


ALARMS

AUTOMATED DOORS

PASSENGER EXPERIENCE

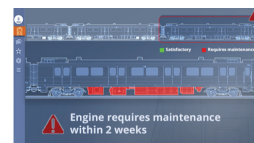
Wifi



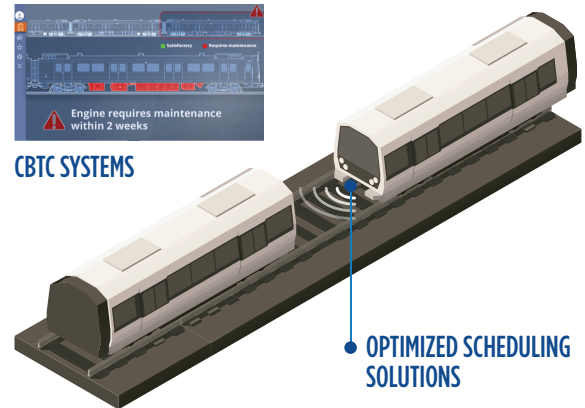
ON-BOARD ENTERTAINMENT

REAL-TIME INFORMATION

ASSET PRODUCTIVITY



CBTC SYSTEMS



OPTIMIZED SCHEDULING SOLUTIONS

MAINTENANCE

SPARE-PART MANAGEMENT SYSTEMS



MAINTENANCE MANAGEMENT SYSTEMS



Meeting these imperatives involves integrating various independent but interconnected systems – each with a unique set of requirements – into a complete, end-to-end solution that will provide the best value.

Our experts guide you step by step to create the robust, interconnected data network you need to unlock the full potential of your modern rail system.

Pathway to a Best-in-Class Connected Rail System

With Belden's help, your complete solution will enhance components throughout the Connected Rail System – rolling stock, rail infrastructure, stations and operation control centers – improving outcomes for all stakeholders.

Each rail application has unique requirements, so Belden creates your connected data network to meet your needs. Our experts know which combinations of technologies work best and they follow industry-leading best practices to create a solution adapted to suit the intricacies of your system.

Most mass transit systems include the following elements:

Element 1:

The Connected Train Network

Establish connections onboard rolling-stock assets

- Train Control Systems
- Train Operations Systems
- Onboard Experience Systems

Element 2:

The Connected Trackside Network

Provide connectivity for track-side equipment

- Train-to-Ground Connections
- Trackside Control Systems
- Trackside Operations Systems

Element 3:

The Connected Station Network

Enable communications for in-station systems

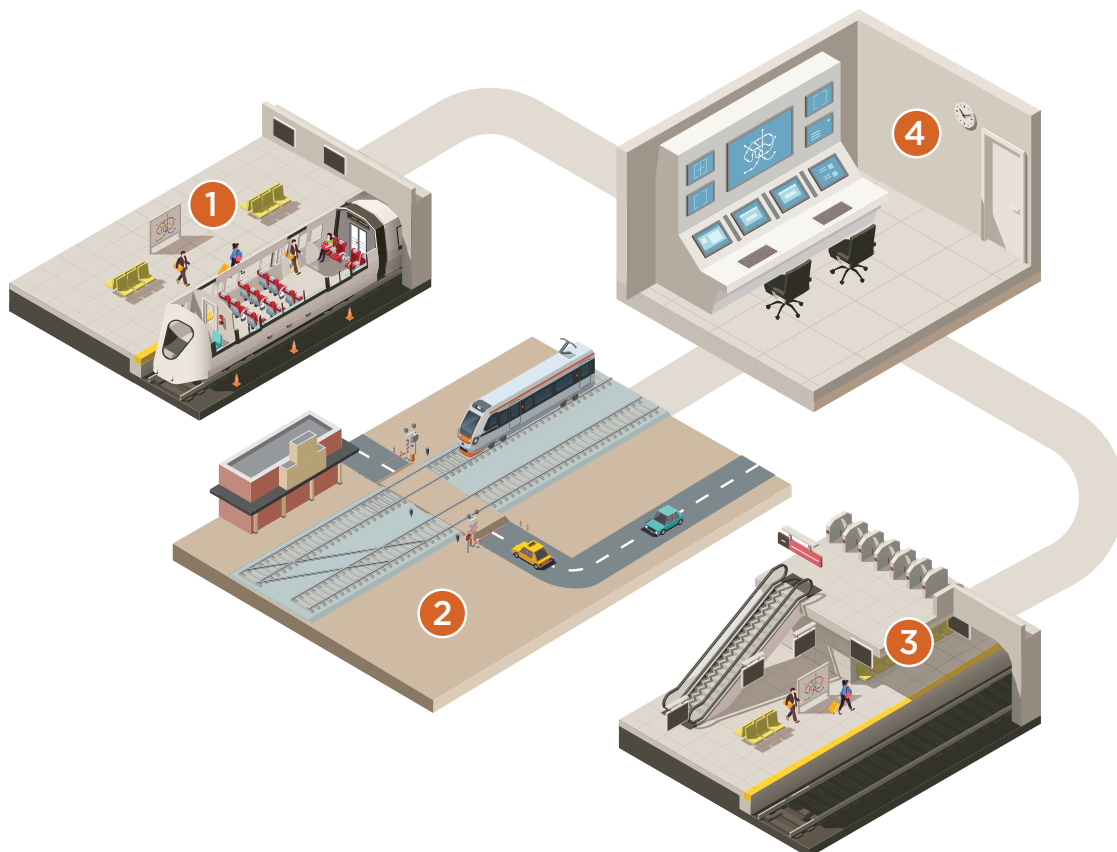
- Station Control Systems
- Station Operations Systems
- In-station Experience Systems

Element 4:

The Connected Backbone and OCC Network

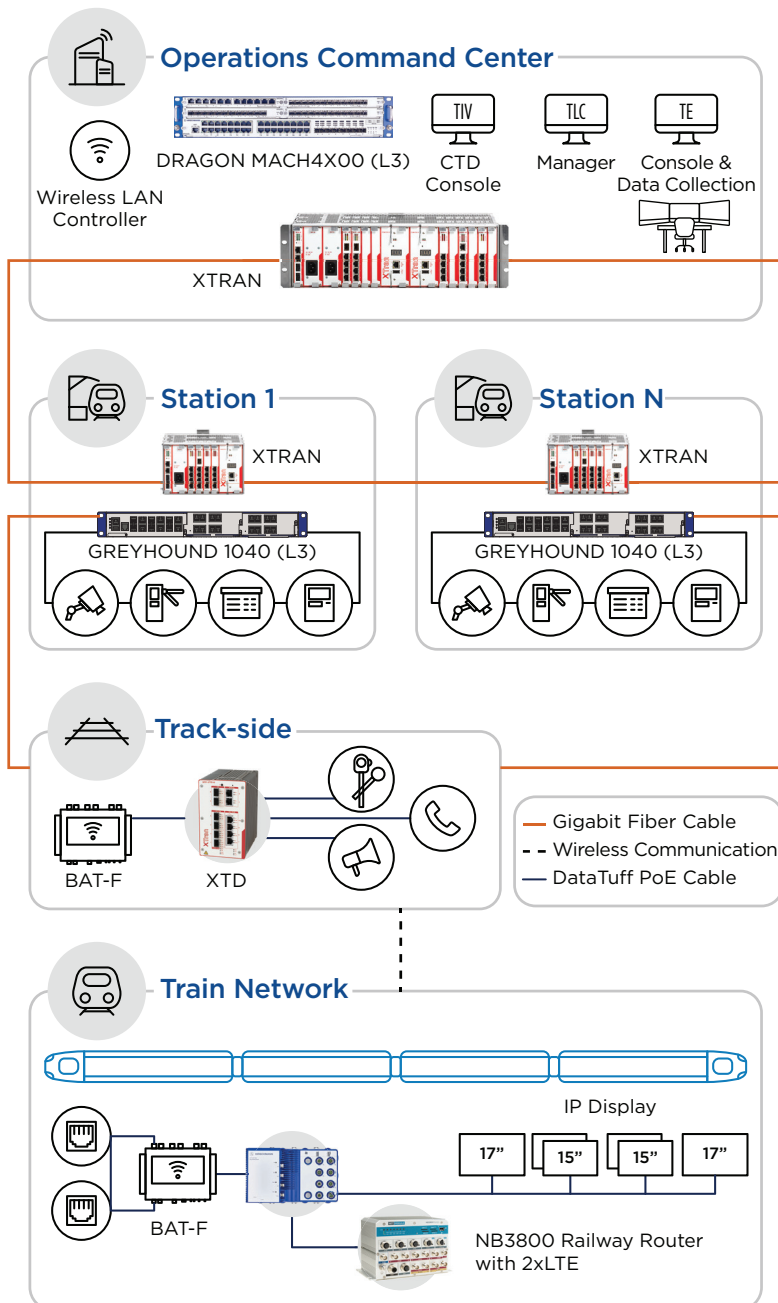
Create a backbone for the OT network

- Area of operation (AO) Interconnections
- Operations Control Center
- Remote Connectivity



Belden – Experts for All Your Networking Needs

As an end-to-end network solution provider, Belden guides you to the products, services and tools you need to move ahead on your digitization journey. With our experts at your side throughout your journey, you will see your unique automation plans come to life through a combination of Belden's extensive network portfolio and appropriate third-party tools and services.



The Connected Backbone and OCC

XT & XTR MPLS-TP nodes
 Mach4500 High density switch/route
 19" Compact Cabinets E-SERIES
 HiVision & TXCare Network Management Software
 NAC Network access controller

The Connected Station Network

19-inch Compact Cabinets E-series
 GRS switch/router
 XTR MPLS_TP node
 AP3400 WiFi6 access points
 EAGLE40-07206 Firewalls

The Connected Trackside Network

RailTuff fiber optic cables
 (TT-*LG-024-HNNN)
 MIPP DIN Rail box
 XTD-2110-A MPLSTP trackside node
 BRS managed switch
 BAT450 Access Point

The Connected Train Network

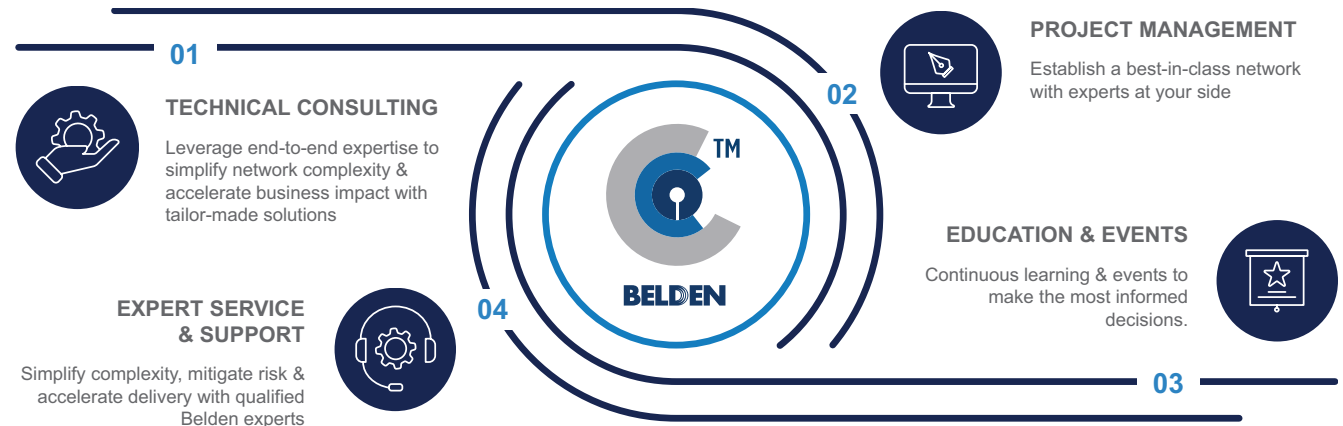
NB3800 Railway Router
 RailTuff ethernet (BE43802)
 BXS High performance switches
 BAT450 High Performance Wireless client
 AP3400 high performance Access Point

Discover the Entire Portfolio

Visit belden.com/mass-transit and contact our experts to learn more on our Mass Transit solutions' products and services offer.





Global Customer Innovation Centers

Belden’s Customer Innovation Centers (CICs) serve your needs throughout the solution development lifecycle. These hubs – strategically located to serve regions throughout the world – offer access to best-in-class capabilities, including the opportunity to run proof of concepts (PoCs) in our Validation Lab.



Our Experts at Your Side

Designing the right solution for your business needs is not an easy task, so Belden provides direct access to our experts.

 Solution Architect	 Digital Automation Consultant	 Solution Consultant	 Solution Engineer
Deep technical knowledge of network architectures Develop, design, and validate best solutions tailored to the complexity of each customer unique business challenge	Industry expertise with deep networking know-how Lead process, workflows, and data assessments to identify digital transformation opportunities and calculate potential value of network solutions for the customer	Deep technical knowledge of applications and industries Guide the customer in their digital transformation journey conducting industrial network audits and positioning the ideal solutions	Deep technical knowledge of products and technologies Conduct trainings, testing and commissioning networks Lead network assessments and deliver high quality pre-sales and post-sales technical support

Learn More

Visit belden.com/mass-transit for additional information and to contact our Mass Transit solution experts.



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About Belden

Belden Inc., a global leader in high quality, end-to-end signal transmission solutions, delivers a comprehensive product portfolio designed to meet the mission-critical network infrastructure needs of industrial, enterprise and broadcast markets. With innovative solutions targeted at reliable and secure transmission of rapidly growing amounts of data, audio and video needed for today's applications, Belden is at the center of the global transformation to a connected world. Founded in 1902, the company is headquartered in St. Louis, USA, and has manufacturing capabilities in North and South America, Europe and Asia.

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