Cisco Transportation Smart Solution

Integrate Your Many Networks into One Reliable IP Network

Cisco® Transportation Smart Solution is a set of secure validated network designs for railways and other mobile transit environments. It has been created to help you comply with the latest legislative mandates for worker and passenger safety. To boost your operational efficiency. And to transform your passengers' experiences with new services.

The TSS foundation is a high-performance unified mobile and Multiprotocol Label Switching (MPLS) network. With it, you can consolidate the aging and disparate proprietary networks you have today into a single, far more powerful IP network. Start with any combination of solutions and add others later:

- **Cisco Connected Rail:** Cisco Validated Designs for Connected Train, Connected Trackside, Connected Station, and Positive Train Control (PTC) components
- **Cisco Premium Mobile Broadband (PMB) 1.0:** Cisco Validated Designs for private, public, and hybrid 4G Long-Term Evolution (LTE) access networks. These are interoperable with Wi-Fi, 3G, and other wireless networks

Cisco Services provides a complete set of services to help plan, build, manage, and support the solutions.

Connecting People, Processes, Data, and Things on the Move

Today, each rail application connects to its own purpose-built network. And maintaining these multiple networks is costly. It's also hard to link the different systems and data together for safety and operational improvements.

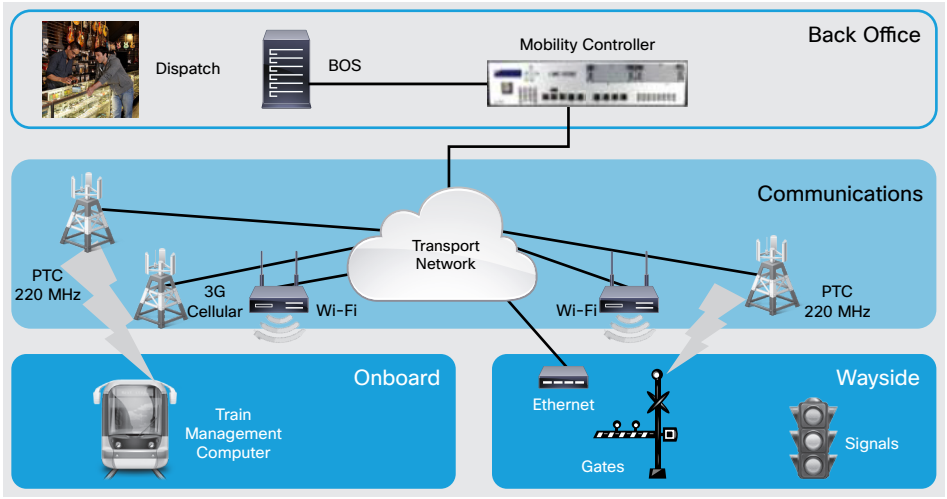
So we developed the Cisco Transportation Smart Solution. You'll be able to merge all your separate networks onto a standard secure network. You'll connect previously unconnected people, processes, data, and things into the Internet of Everything. You'll have new and better ways to keep passengers and employees safe. To operate efficiently. And to delight passengers with new services.

Connected Rail

The Connected Rail Solution has the following building blocks. Use them in any combination:

- **Connected Train** helps you create an efficient and safe operation or passenger experience. Passengers will enjoy onboard Wi-Fi and mobile applications that deliver entertainment, advertising, and scheduling information. Cisco Video Surveillance lets public safety officers view real-time or recorded video feeds on any device. This helps to deter employee theft, passenger misconduct, and vandalism and to accelerate incident response times.
- **Connected Trackside** connects all of the train's onboard systems to the trackside network. An IP network replaces all of your proprietary supervisory control and data access (SCADA) networks for reduced complexity and lower costs. You'll also improve safety: for example, train operators can view video from the boarding platform to see if passengers need more time to board before doors close. And public safety personnel can communicate directly using any kind of radio, wired or wireless phone, or PC with client software.
- **Connected Station** provides passenger amenities that help you increase ridership. High-performance Wi-Fi allows commuters to download or upload large files before and after their rides. Touchscreen kiosks provide wayfinding, transportation schedules, and local attractions. Video surveillance cameras and help-point telephones help create a safe environment for passengers and employees.
- **Positive Train Control (PTC)** is a safety mandate in the U.S. passed by Congress as federal law. The goal is to help prevent train collisions, derailments, and other human-caused rail accidents. Cisco has teamed with Lilee Systems to resell its line of radios under an OEM agreement as Cisco validated products for a complete PTC solution (see Figure 1). Cisco PTC blends industry-leading 220-MHz radio systems with Cisco's networking expertise

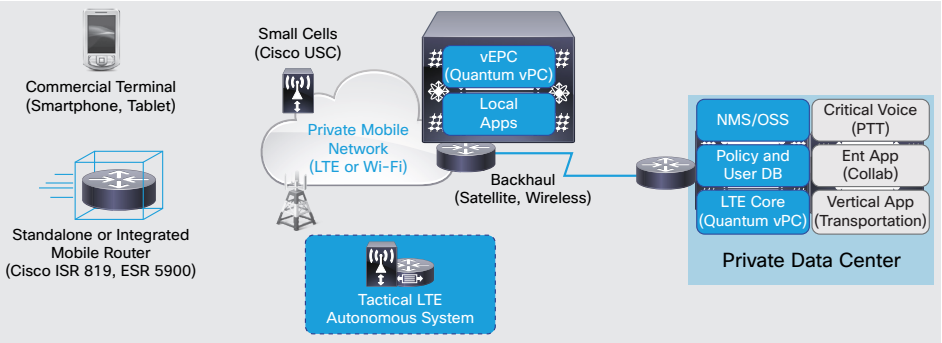
Figure 1. Cisco Positive Train Control (PTC) Solution



Cisco Premium Mobile Broadband 1.0

Cisco Premium Mobile Broadband augments your existing Land Mobile Radio network with multiple redundant backup options. If one network goes down, your router automatically connects over another — with no interruption. Connected workers, passengers, and vehicles move from one network to the other without disruption. Cisco PMB can use Wi-Fi if available. If not, it can connect to any 4G LTE, 3G, or other radio network. Public safety, mass transit, and rail operators and their network service providers can use Cisco PMB to build their own private or hybrid public/private LTE networks (see Figure 2).

Figure 2. Cisco PMB Solution



Here's How You Benefit

- **Mobility:** Provide Wi-Fi and other passenger services in trains and stations to increase ridership and enhance the passenger experience. Connect video surveillance cameras in trains, at trackside, and in stations.
- **Safety:** Increase situational awareness by viewing live video feeds on laptops, tablets, and smartphones. Or view archived video during incident investigations and to respond to injury claims.
- **Communications interoperability:** Enable everyone involved in incident response to communicate directly, using any device — with or without a dispatcher. Join talk groups from smartphones.
- **Efficiency:** Lower your operational costs by consolidating multiple proprietary networks into one IP network.
- **Communications resilience:** Today, if the service provider network goes down, so does your critical network. Now you can design it using multiple radio technologies and networks for business continuity. Wi-Fi, software-defined radios (SDRs), 4G LTE, and 3G. Connections can look for Wi-Fi first, to keep costs down. Passenger and employee services are not interrupted during network switchovers.
- **Potential for cellular offload revenues:** Mobile device use keeps growing, and cellular carriers are looking to offload mobile WAN traffic to fixed Wi-Fi picocells. Rail stations are good locations for this because of their high-capacity fixed networks.

"We can look in real time at queues and the loading of trams and buses, and use these new and valuable insights to improve services. Should the police make an incident enquiry as part of a criminal investigation, we're able to provide exceptionally high-quality footage that can be used as evidence in court."
— **Rohan Mendis**, ICT Consultant, Transport for Greater Manchester

Why Turn to Cisco?

- **Commitment:** Cisco is in the transportation market to stay. We've created Cisco Validated Designs with input from transportation industry leaders including Bombardier, BNSF Railroad, Network Rail, Lilee Systems, Deutsche-Bahn, SFMTA (San Francisco Metro Transit Authority), and Transport for Greater Manchester.
- **Cisco Services:** From strategy to execution, we help you plan, build, manage, and support your Cisco Transportation Smart Solution. We apply our industry leading experience to help you improve system operational efficiency, scalability, security, and profitability. With an end-to-end approach that aligns outcomes to your business goals.
- **Validated architecture:** A comprehensive architecture minimizes risk and helps accelerate deployment.
- **World-leading network technology:** Cisco networks are reliable, secure, and flexible.
- **Ruggedized products:** Cisco switches, routers, wireless access points, and high-definition (HD) IP video surveillance cameras are ruggedized to withstand shock, vibration, extreme temperatures, dust, wind, moisture, and humidity.
- **Compliance:** Cisco Transportation Smart Solution adheres to National Institute of Standard Technology (NIST) standards for public safety.

Next Steps

For more information about Cisco Transportation Smart Solutions, visit: www.cisco.com/go/transportation.

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