APTA STANDARDS PROGRAM

RECOMMENDED PRACTICE

APTA RT-SC-RP-008-03, Rev. 1

First Published: January 28, 2004

First Revision: September 11, 2025

APTA Signals and Communications Working Group

Train-to-Wayside Communication System Inspection and Testing

Abstract: This recommended practice provides guidelines for inspecting and testing rail transit signal system train-to-wayside communication systems.

Keywords: antenna, communication, departure test, dispatching, inspection, receive, signal, test, testing, train, train-to-wayside communications, transmit

Summary: This document establishes recommended guidelines for inspecting and testing rail transit non-vital train- to-wayside communication systems including station, departure test, and train dispatching components.

Foreword

The American Public Transportation Association is a standards development organization in North America. The process of developing standards is managed by the APTA Standards Program's Standards Development Oversight Council (SDOC). These activities are carried out through several standards policy and planning committees that have been established to address specific transportation modes, safety and security requirements, interoperability, and other topics.

APTA used a consensus-based process to develop this document and its continued maintenance, which is detailed in the manual for the APTA Standards Program. This document was drafted in accordance with the approval criteria and editorial policy as described. Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

This document was prepared by the Signals and Communications Working Group as directed by the APTA Rail Transit Standards Policy Committee.

This document represents a common viewpoint of those parties concerned with its provisions, namely transit operating/planning agencies, manufacturers, consultants, engineers and general interest groups. The application of any recommended practices or guidelines contained herein is voluntary. APTA standards are mandatory to the extent incorporated by an applicable statute or regulation. In some cases, federal and/or state regulations govern portions of a transit system's operations. In cases where there is a conflict or contradiction between an applicable law or regulation and this document, consult with a legal adviser to determine which document takes precedence.

This document supersedes APTA RT-SC-RP-008-03, which has been revised. Below is a summary of changes from the previous document version:

- Use of the new APTA template which standardizes and reorganizes the document.
- Scope and purpose have been combined and updated to be more specific.
- Updated list of participants.
- Updated definitions to be consistent with standard definitions.
- 3.7.2 updated to be more general about testing operating parameters as opposed to "transmit and receive signals."
- Annex A removed as extraneous since its contents were already mentioned in the document.

Table of Contents

Participants

The American Public Transportation Association greatly appreciates the contributions of the **Signals and Communications Working Group**, which provided the primary effort in the drafting of this document.

At the time this recommended practice was completed, the working group included the following members:

Aderemi Omotayo, Chair, *LA Metro*
Jeff McCormack, Vice Chair, *AECOM*
Kurt Slesinger, Secretary, *Mott MacDonald*

Salvatore Ambrosino, *MTA New York City Transit*
Zafar Arif, *TriMet*
Jose Arriojas, *NJ TRANSIT*
Charles Barlow, *EverGlow NA*
Ryan Becraft, *Denver Transit Operators*
Frank Beeck, *Rail-IT*
Peter Bertozzi, *Patrick Engineering*
Stephane Bois, *Jacobs*
Mark Bressi, *Hitachi Rail*
Randy Brundridge, *KB Signaling*
Michael Bunnell, *MTA Metro-North Railroad*
Anthony Candarini, *AECOM*
Dmitriy Chelobanov, *Hitachi Rail*
Andrew Clapham, *Network Rail Consulting Ltd.*
Benjamin Claus, *Pittsburgh Regional Transit*
Nicholas Columbare, *KB Signaling*
David Coury, *Transit Systems Engineering*
Michael Crispo, *Hatch*
Ismail Dahel, *Icomera US*
Philip Dang, LA *Metro*
Jaykumar Desai, *Atkins*
Nolan James, Dick, *Keolis North America*
Rahul Dixit, *Mott MacDonald*
Martin Dyess, *Dallas Area Rapid Transit*
Stephen Farrell, *Transit Systems Engineering*
Bruce Fenlason, *Metro Transit- Hiawatha Light Rail*
John Frisoli, *SEPTA*
Johann Glansdorp, *WMATA*
Alex Goff, *Junction Rail Consulting*
Howard Goldberg, *Mott MacDonald*
Howard Gregson, *AECOM*
Pat Guest, *NICTD*
Daniel Hernandez, *Chicago Transit Authority*
Juan Carlos Hernandez, *Mott MacDonald*
Tru Hong, *Gannett Fleming*
Rameez Iftikhar
Peter Koonce, *City of Portland*
Justin Lee, *TriMet*
Philip Lee, *WMATA*
Michael Lowder, *Vanasse Hangen Brustlin*
Scott Matonak, *Hitachi Rail STS*
William McClellan, *ACI*
Jerry McCormack, *Vomar Products*
Eric McGraw, *Chicago Transit Authority*
Douglas McLeod, *Network Rail Consulting*
Douglas Minto, *retired*
Jeannette Mitchell, *Chicago Transit Authority*
Sherri Mohebbi, *Information Technologies Curves*
Javier Molina, *Dallas Area Rapid Transit*
Thomas Newey, Network Rail Consulting
Ojo Nwabara, *Hitachi Rail* STS
William Palko, *Mott MacDonald*
Shushil Ramnaress, *WMATA*
Stephen Ranck, *KB Signaling*
Daniel Reitz, *Port Authority Trans-Hudson Corp.*
Louis Sanders, *Ayers Electronic Systems*
Prajakta Savant, *TYLIN*
Nitant Sethi, *ARCADIS U.S.*
Tim Shoppa, *WMATA*
Dhawal Shukla, *AECOM*
Wei Sun, *Mott MacDonald*
Narayana Sundaram, *WMATA*
Janet Ungerer, *AECOM*
Phil Wellman, *Metro Transit*
James Winter, *Siemens Mobility*

Project team
Eugene Reed, *American Public Transportation Association*

Introduction

This introduction is not part of APTA RT-SC-RP-008-03, "Train-to-Wayside Communication System Inspection and Testing."

APTA recommends the use of this document by:

- individuals or organizations that operate rail transit systems;
- individuals or organizations that contract with others for the operation of rail transit systems; and
- individuals or organizations that influence how rail transit systems are operated (including but not limited to consultants, designers and contractors).

Scope and purpose

This recommended practice provides guidelines for inspecting and testing rail transit train-to-wayside communication systems. It does not cover testing OCC tracking and scheduling functions (i.e., passenger information systems, voice communications, etc.) and carborne portions of the train-to-wayside communications system. The purpose of this recommended practice is to verify that non-vital train-to-wayside communication systems and equipment are operating safely and as designed through periodic inspection and testing, thereby increasing reliability and reducing the risk of hazards and failures.

Train-to-Wayside Communication System Inspection and Testing

1. Inspection and testing provisions

1.1 Inspection and testing frequency

The inspection and testing procedures in this recommended practice should be performed when train-to-wayside communications systems are placed in service, when they are modified, repaired, or disarranged, or as otherwise deemed necessary by the rail transit system.

The rail transit system should determine the need for additional inspection and testing frequencies for train-to-wayside communications systems. A review of the following factors may be useful in making this assessment:

- OEM-recommended intervals
- industry experience
- operating environment/conditions
- historical data
- reliability-centered maintenance program development
- failure analysis
- rail transit system testing and experience
- regulatory requirements

The frequency of tasks should comply with applicable federal, state, and local regulations.

1.2 Training

The rail transit system and/or their maintenance contractors should develop and execute training programs that provide employees with the knowledge and skills necessary to safely and effectively perform the tasks outlined in this recommended practice.

1.3 Materials

No consumable materials are recommended for inspecting and testing train-to-wayside communications systems unless otherwise specified by the OEM and/or rail transit system.

1.4 Tools

The following tools are recommended for inspecting and testing train-to-wayside communications systems:

- multimeter*
- rail transit system–approved portable radio
- standard tools carried by maintenance personnel
- additional tools as recommended by the OEM and/or rail transit system

NOTE: Tools marked with an asterisk (*) should be calibrated in accordance with OEM and/or rail transit system requirements.

1.5 Personal protective equipment

Personal protective equipment, as required by the rail transit system, should be worn at all times during inspection and testing.

1.6 Safety

rail transit system safety rules, procedures, and practices shall be followed at all times during inspection and testing.

1.7 Inspection and testing procedures

Train-to-wayside communication system inspection and testing procedures may be modified for each rail transit system's requirements but should contain the steps listed in sections 1.7.1 and 1.7.2 as a minimum.

1.7.1 Inspection

1. Notify the Operations Control Center (OCC) and/or other authorities of the inspection activities to be performed.
2. Inspect wayside equipment enclosures, and junction boxes for rust, corrosion, damage, cracks, breaks, defective latches, hinges, locks, covers, seals, gaskets, loose conduit connections, and missing or loose components and hardware. Holes and entrances not used for ventilation should be sealed.
3. Inspect wayside cables, conduit, and antennas for defective insulation, rust, corrosion, missing components, damage, and loose or broken connections.
4. Inspect transmit and receive equipment for physical damage, frayed, or loose wiring, properly secured plugs and connectors, loose or missing hardware, and proper insertion of printed circuit cards and components.
5. Inspect area for debris, water, or any other conditions that could adversely affect operation of the equipment.
6. Ensure that covers and locks are in place and secured.
7. Notify the OCC and/or other authorities when inspection is complete.

1.7.2 Testing

1. Notify the OCC and/or other authorities of the testing activities to be performed.
2. Measure power supplies and power sources for proper values and tolerance.
3. Test and measure operating parameters in accordance with OEM and/or rail transit system procedures.
4. Observe train-to-wayside communication, departure test (if applicable), and dispatching systems for proper operation using revenue or test train.
5. Perform additional functional testing as required by OEM and/or rail transit system to ensure proper operation.
6. Ensure that covers and locks are in place and secured.
7. Notify the OCC and/or other authorities when testing is complete.

1.8 Correction of deficiencies

Deficiencies identified during train-to-wayside communication system inspection and testing should be corrected and documented in accordance with OEM and/or rail transit system requirements.

1.9 Documentation

Inspection and testing activities should be documented, reviewed, and filed in accordance with rail transit system procedures.

Definitions

departure test: The process used to test rail transit vehicle systems controlled by train to wayside communication equipment.

hazard: Any real or potential condition that can cause injury, death, or damage or loss of equipment or property.

Operations Control Center (OCC): A location or locations designed, equipped, and staffed for the purposes of monitoring and controlling rail transit system activities from a central location or locations. Also called *rail control center*, *rail operations center*, *rail service control center*.

original equipment manufacturer (OEM): The enterprise that initially designs and builds a piece of equipment.

personal protective equipment (PPE): All clothing and other work accessories designed to create a barrier against workplace hazards. Examples include safety goggles, blast shields, hard hats, hearing protectors, gloves, respirators, aprons, and work boots.

rail transit system: The organization or portion of an organization that operates rail transit service and related activities. Also called *operating agency*, *operating authority*, *transit agency*, *transit authority*, *transit system*.

receive signal: Energy containing encoded information sent from transit vehicle antennas to wayside antennas.

train dispatching: A automatic or supervisory process used to control and monitor the departure of rail transit vehicles from specific locations.

train-to-wayside communications (TWC): Non-vital transmission of data from a transit vehicle to wayside systems or from wayside systems to a transit vehicle, which may include train identification, length, door status, positioning reference information, approaching station information, speed and acceleration modification, departure testing, and dispatching instructions.

transmit signal: Energy containing encoded information sent from wayside antennas to transit vehicle antennas.

Abbreviations and acronyms

OCC	operations control center
OEM	original equipment manufacturer
PPE	personal protective equipment
TWC	train-to-wayside communications

Document history

Document Version	Working Group Vote	Public Comment/ Technical Oversight	Rail CEO Approval	Policy & Planning Approval	Publish Date
First published	June 10, 2003	Sept. 28, 2003	—	Jan. 28, 2004	Jan. 28, 2004
First revision	Mar. 2, 2024	Dec. 2, 2024	Feb. 21, 2025	Sep. 10, 2025	Sep. 11, 2025