



APTA RT-OP-S -016-11, Rev. 2

First Published: November 1, 2011

First Revision: October 6, 2016

Second Revision: August 16, 2023

Rail Transit Standards Operating
Practices Working Group

Roadway Worker Protection Program Requirements

Abstract: This standard provides minimum program requirements for roadway worker protection (RWP). Such programs require adherence to clear rules and procedures, appropriate training, certification, and retraining, as well as regular monitoring of right-of-way safety compliance. This document is designed to incorporate all these elements and introduce a consistent approach throughout the rail transit industry.

Keywords: employee in charge, flagging, fouling, on-track equipment, right-of-way, right-of-way safety, roadway worker protection, track safety, wayside work, work zone, work zone safety.

Summary: Operating rules are created to promote safe, efficient, timely and customer-oriented transit operations. Adherence to these operating rules is necessary to achieve these objectives. The objective of an RWP program is to create conditions in which workers may perform duties on or near the right-of-way with consistent and strong programs in place to ensure worker safety. A comprehensive RWP program includes rules and procedures for employee actions, formalized supervision and control actions, administration of training programs, and effective use of technology by the rail transit agency. This standard incorporates and/or references provisions included in other APTA standards (see “Related APTA standards”).



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 Rail Transit Standards Operating Practices Working Group as directed by the [Rail Standards Policy and Planning 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. 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-OP-S -016-11, Rev. 1, which has been revised. Below is a summary of changes from the previous document version:

- Added keywords “fouling,” “on-track equipment,” “employee in charge.”
- Changed “rail transit system (RTS)” to “rail transit agency” throughout.
- Added references to other related RWP standards in both Summary and Introduction.
- Changed reference from System Safety Program Plan (SSPP) to Public Transportation Agency Safety Plan (PTASP).
- Added clarification language to Section 1.1.
- Added reference to and details for FTA Safety Advisory 14-1 to Section 1.2.
- Added additional references to other APTA standards in Section 1.2.
- Added provisions for employee certification verification, traction power isolation, FTA regulatory compliance, and as-applicable FRA compliance to Section 1.2.
- Made minor clarification edits to Section 1.3.
- Changed title of Section 1.4 from “Responsibility of individual roadway workers” to “Responsibility of *all* roadway workers.”
- Added new provisions to list of safety briefing requirements in Section 1.5, including track work limits, level of protection, audible warning, work plan changes, minimum warning times, place of safety, PPE requirements, designated emergency individuals and notification requirements, and place of egress.
- Added provision for employees to acknowledge understanding of work instruction.
- Added reference to alternate term “roadway worker in charge” in Section 1.6.2.
- Changed “train dispatcher or control operator” to “control center personnel” throughout.
- Added minor clarification language to Section 1.6.3.
- Added requirements for reporting equipment and people clear of track to Section 1.6.4.
- Added explanation of term “non-controlled tracks” to Section 1.6.5.



- Added expectation on rail transit agency to define its use of term “place of safety” to Section 1.6.6.
- Added Section 1.9 regarding secondary warning methods and use.
- Added Section 1.10 regarding minimum clearance.
- Added Section 1.11 regarding access for unqualified individuals on a ROW.
- Added additional requirements to Section 2.4.1 for authorized electronic devices and other methods determined by rail transit agency.
- Added clarifying language to Section 3.1.
- Added requirements for personal electronic devices and characteristics of moving trains to Section 3.2.1.
- Removed extraneous requirement for return-to-work in Section 3.2.2 since it is covered by other qualification requirements.
- Added Section 4 on hazard assessment/safety risk assessment.
- Added considerations to Section 5 on technology being failsafe, RWP worker involvement in technology evaluation, and applying a cost benefit analysis based on individual agency needs.
- Removed definition and acronym for SSPP and replaced with PTASP
- Added Appendix 1.



Table of Contents

Foreword.....	ii
Participants.....	v
Introduction.....	vi
Scope and purpose	vi
Note on alternate practices.....	vii
1. Rules and procedures	1
1.1 Introduction.....	1
1.2 Responsibility for an on-track safety program.....	1
1.3 Responsibility of operators	2
1.4 Responsibility of all roadway workers.....	2
1.5 On-track safety briefings.....	3
1.6 On-track safety rules and procedures.....	4
1.7 Audible warning and hand signals.....	7
1.8 On-track equipment	8
1.9 Secondary warning methods and use.....	8
1.10 Minimum clearance	8
1.11 Access for unqualified individuals on the ROW.....	8
2. Supervision and control.....	9
2.1 Introduction.....	9
2.2 Establishment and notification of roadway allocation	9
2.3 Supervision and control responsibilities	9
2.4 Communications	9
2.5 Rules compliance program.....	10
2.6 Record-keeping.....	10
3. Training.....	10
3.1 Training program	10
3.2 Training course requirements/elements	11
4. Hazard assessment/safety risk assessment.....	12
5. Technology	12
Related APTA standards.....	13
Definitions.....	13
Abbreviations and acronyms.....	15
Document history.....	15
Appendix A: Train approach warning chart examples.....	16

List of Figures and Tables

Figure 1 Train Approach Warning Chart	16
--	----



Participants

The American Public Transportation Association greatly appreciates the contributions of the **Jim Smith, Mark Benedict, Joe Tassiello, Martin Gulley, Tony Onisko, Greg Robinson, Gerard Ruggiero, David Moskowitz, Andrew Ghiassi, Roy Aguilera, Gary Howard, Brian Riley, Amanda Nightingale, Richard Dobbins, and Joyce Rose**, who provided the primary effort in the drafting of this document.

At the time this standard was completed, the Rail Transit Standards Operating Practices Working Group included the following members:

Gary Howard, Chair, *Metropolitan Transit Authority of Harris County*

Roy Aguilera, Vice Chair, *WMATA*

Mark Benedict, Second Vice Chair, *Metro Transit*

Tony Abdallah, *MTA New York City Transit*

Ray Abraham, *Valley Metro*

Gerald Alfred, *MAX Transit*

Mark Benedict, *Metro Transit Hiawatha Light Rail*

Joseph Black, *Jacobs*

Shanita Bowman, *WMATA*

Patrick Brouard, *TRC*

Louis Brown, *Jacobs*

Robb Bury, *BART*

Paul Chandler, *Valley Metro*

Andrew Clapham, *Network Rail Consulting*

Demetrius Crichlow, *MTA New York City Transit*

Kenneth DeBow, *Valley Metro*

Paul Denison, *Sound Transit*

Sidney Dimanche, *Alstom*

Brian Dwyer, *WMATA*

Ronald Ester, *MBTA*

Lucas Ewing, *Utah Transit Authority*

Anthony Fazio, *SEPTA*

Zandra Ford, *Maryland Transit Administration*

Frank Fowler, *Niagara Frontier Transit*

Paula Fraser, *BART*

Kris Gandham, *Dallas Area Rapid Transit*

Tom Gerend, *Kansas City Streetcar Authority*

Andrew Ghiassi, *Bi-State Development Agency*

Rachelle Glazier, *Ben Franklin Transit*

Camille Glenn, *Utah Transit Authority*

Andrea Gordon, *MBTA*

Martin Gulley, *Bi-State Development Agency*

Tina Hall, *Charlotte Area Transit System*

Jay Harper

Deltrin Harris, *Charlotte Area Transit System*

Melvyn Henry, *SFMTA*

Jhaun Jasper, *Chicago Transit Authority*

Kenneth Jefferson, *JTA*

Stephen Lino, *LA Metro*

Reginald Mason, *Hill International*

Lisa Matta, *Wi-Tronix*

William McClellan, *Alternate Concepts*

Javier Molina, *Dallas Area Rapid Transit*

Thomas Newey, *Network Rail Consulting*

Amanda Nightingale, *King County Metro*

Dedric Parham, *MARTA*

Richard Plokhaar, *HDR*

Patrick Preusser, *City and County of Honolulu DOT*

Gregory Robinson, *Miami-Dade Transit*

Joyce Rose, *WSP USA*

James Ross, *ONxpress Operations Inc.*

Gerard Ruggiero, *ADS System Safety Consulting*

Duane Sayers, *Regional Transportation District*

James Smith, *Bi-State Development Agency*

Mike Smith, *Regional Transit Authority*

Constance Sullivan, *Utah Transit Authority*

Narayana Sundaram, *WMATA*

Peter Sutcliffe, *MaxAccel*

Joseph Tassiello, *NJ Transit*

Debra Thacker, *Valley Metro*

Kenneth Williams, *ATL Airport*

Henry Woods, *MARTA*

Project team

Marie Benton, *American Public Transportation Association*

Tdisho Pendleton, *American Public Transportation Association*



Introduction

This introduction is not part of APTA RT-OP-S -016-11, “Roadway Worker Protection Program Requirements.”

The Operating Practices Working Group members developed this standard to formalize safe operating practices as they pertain to work performed on or in close proximity to rail transit rights-of-way. Rail transit agencies are free to develop more restrictive rules than are provided for in this standard. Federal or state laws that are more restrictive than this standard supersede this standard and must be followed.

This standard has been developed to serve as a supplement to APTA RT-OP-S-004-03, “Work Zone Safety Practices,” and provide additional guidance for the development of roadway worker protection programs. It has been designed to not conflict with that or other related work zone safety standards and recommended practices. Other APTA standards address different aspects of safety on the ROW, and they should be reviewed concurrently with this standard. “Contractors’ Responsibility for Safety on the Right-of-Way” provides requirements for the rail transit agency to establish a contractor-specific guideline that describes safety requirements that apply to contractor activities on or near the ROW. “On-Track Equipment (OTE) Safety Requirements” contains detailed requirements for the design and operation of OTE. “Rail Transit Track Allocation Program Requirements” establishes a requirement and framework for a formal process to request and grant access to perform work on or near the ROW. “Roadway Worker Near-Miss Reporting Requirements” provides a framework for developing an effective near-miss reporting program for rail transit agencies to implement.

In contrast, this APTA standard focuses on the broader RWP requirements related to both work along the right-of-way and the management of train movement past or through work areas. Rail transit agencies are expected to determine the type of roadway protection for non-roadway workers.

Scope and purpose

This standard applies to light and heavy rail transit systems. For the purpose of this standard, streetcar sections should refer to sections of the standard that are directed to light rail systems. It does not apply to commuter railroads that operate on the general railroad system regulated by the Federal Railroad Administration. This standard also applies to those light rail systems that operate under a “shared use waiver” issued by the FRA, but only to the extent that the FRA Railroad Workplace Safety – Roadway Worker Protection rules do not apply to the system or particular groups of employees at the system.

This standard applies to all roadway workers, as defined in this standard, as well as operating personnel and passenger vehicle maintenance personnel. The purpose of this standard is to eliminate or reduce the number of incidents in which roadway workers are struck and injured or killed by trains or any on-track equipment in the right-of-way. That can best be accomplished through a formal program that demands adherence to safety throughout individual agencies and the entire rail transit industry.



Note on alternate practices

Individual rail transit systems may modify the practices in this standard to accommodate their specific equipment and mode of operation. APTA recognizes that some rail transit systems may have unique operating environments that make strict compliance with every provision of this standard impossible. As a result, certain rail transit systems may need to implement the standards and practices herein in ways that are more or less restrictive than this document prescribes. A rail transit system may develop alternates to APTA standards so long as the alternates are based on a safe operating history and are described and documented in the system's safety program plan (or another document that is referenced in the system safety program plan).

Documentation of alternate practices shall:

- identify the specific APTA rail transit safety standard requirements that cannot be met;
- state why each of these requirements cannot be met;
- describe the alternate methods used; and
- describe and substantiate how the alternate methods do not compromise safety and provide a level of safety equivalent to the practices in the APTA safety standard (operating histories or hazard analysis findings may be used to substantiate this claim).

Roadway Worker Protection Program Requirements

1. Rules and procedures

1.1 Introduction

Rail transit agencies require periodic, scheduled inspections and maintenance of track, switches, signals, traction power, stations, other wayside equipment and the general right-of-way (roadway). In addition to those scheduled work activities, unscheduled emergency repairs of system elements and non-rail transit work activities that impinge on the rail transit right-of-way are also common activities associated with a rail transit agency. The protection of employees who perform those work activities is vital and ensured through the establishment of and strict adherence to rules and procedures governing roadway workers, train operators and control center personnel.

1.2 Responsibility for an on-track safety program

Each rail transit agency shall adopt and implement an on-track safety program that will afford on-track safety to all roadway workers whose duties are performed at that agency.

Each on-track safety program shall include, at a minimum, the following elements:

- Adherence to FTA Safety Advisory 14-1: Right-of-Way Worker Protection, incorporating recommendations from the National Transportation Safety Board (NTSB)
 - Issue a directive to all rail transit properties requiring redundant protection for roadway workers, such as positive train control, secondary warning devices, or shunting. (R-13-39) (Urgent)
 - Issue a directive to require transit properties to review their wayside worker rules and procedures and revise them as necessary to eliminate any authorization that depends solely on the roadway worker to provide protection from trains and moving equipment. (R-13-40) (Urgent)
- Procedures designed to put in place practices for working in a manner that minimizes danger of roadway workers being struck by moving trains or other on-track equipment. These procedures shall be prescribed by operating and safety rules that govern track occupancy by personnel, trains and on-track equipment. These rules and procedures shall be appropriate for the operating rail transit agency, taking into consideration the operating environment, train operating speed, equipment, geographical location, climate conditions, and specific duties of roadway workers.
- A definition of track fouling distances, considering the working limits and proximity to wayside traction power equipment that may be live, and/or the roadway for the purposes of this standard.
- A program of training and qualification of employees and contractors to ensure competence and demonstrated proficiency in on-track safety procedures.
- A record-keeping system capable of monitoring training and qualification records.
- A process for allocation of track usage rights developed in accordance with the provisions contained within APTA RT-OP-S-020-13, “Rail Transit System Track Allocation Program Requirements.”

APTA RT-OP-S-016-11, Rev. 2
Roadway Worker Protection Program Requirements

- A process to encourage and allow roadway workers to report near misses and unsafe acts and/or conditions, consistent with APTA RT-OP-RP-026-20, “Roadway Worker Near-Miss Reporting Requirements.”
- A process for the rail transit agency to address reported near misses and unsafe acts or conditions.
- Procedures to be used by each rail transit agency for monitoring the effectiveness of and compliance with the program.
- An on-track safety program document that includes all rules and operating procedures governing track occupancy and protection, which is readily available to all roadway workers.
- Procedures to guarantee that roadway workers have the absolute right to challenge in good faith whether the on-track safety procedures comply with the rules of the rail transit agency, and to remain clear of the track until the challenge is resolved. The good-faith challenge process shall include a procedure to achieve a fair and equitable resolution of the challenges made.
- Provisions for multiple work groups within a common work area.
- A process for determining the level of access, training, supervision and/or escort required for all individuals accessing the roadway.
- A process for in-person verification of the current certification/qualification of individuals working on or near the ROW (certification card, sticker, ID, etc., which are kept on the person at the work location).
- A process or procedures for traction power isolation/removal/restoration and verification requirements for control center personnel and roadway workers.
- Provisions related to FTA compliance with 49 CFR Part 673, including requirements for rail transit agency administration of an employee safety reporting program.
- Provisions related to FRA compliance with 49 CFR Part 214, if applicable.

Each rail transit agency shall maintain on-track safety program documents.

The on-track safety program shall require each roadway worker responsible for the on-track safety of others, and each lone worker (where applicable), to be provided with a copy of the on-track safety program rules and procedures. A copy of the on-track safety program rules and procedures shall be available at each work location and accessible to all roadway workers for reference.

1.3 Responsibility of operators

An on-track safety program shall contain provisions that operators must follow, but not be limited to, when approaching and entering work zones:

- Operate on-sight/by line of sight and have their rail vehicle under control at all times.
- Be observant for unusual conditions and/or hazards while passing through the work zone.
- Obey all rules, regulations, procedures and special operating instructions.
- Comply with all written notices that may be posted or issued to them, monitor radio transmissions, and obey verbal instructions and hand signals regarding work taking place on the right-of-way.
- Stop and report any improper or missing hand signals and/or flagging protection.
- Properties with automatic train operation (ATO) may require manual operation where roadway workers are present.

1.4 Responsibility of all roadway workers

An on-track safety program shall contain provisions that do the following:

- Require each roadway worker to be responsible for following the on-track safety rules of the rail transit agency upon which the roadway worker is located.

APTA RT-OP-S-016-11, Rev. 2
Roadway Worker Protection Program Requirements

- Prohibit fouling a track, except when necessary for the performance of duty.
- Require each roadway worker, including OTE operators and pilots, to participate in safety briefing(s) to ascertain that on-track safety is being provided.
- Allow roadway workers to challenge any condition that the roadway worker believes may violate an on-track safety rule and to inform the employer whenever the roadway worker makes a good-faith determination that on-track safety provisions to be applied at the job location do not comply with the rules of the operating rail transit agency.
- Require roadway workers to report unsafe acts or conditions that could result in an accident or incident.

1.5 On-track safety briefings

An on-track safety program shall include procedures for conducting and participating in a safety briefing before beginning work and when work or job conditions change. Before any roadway worker fouls a track, the designated person providing on-track safety for the group shall ensure that a job safety briefing is held, as prescribed by this standard. Additional job safety briefings shall be held anytime the job conditions change during the work period. Such information shall be given to all affected roadway workers before the change is effective. Emergency situations do not relieve the requirement for on-track safety briefings.

The briefing shall include, at a minimum, the following items:

- discussion of the general work plan
- discussion of the track, track/work limits and limits of the established protection
- discussion of level of protection established
- information on the means by which on-track safety is to be provided for each track identified to be fouled
- identification and location of key personnel, such as the qualified protection employee (QPE), watchperson/lookout, etc.
- existing or potential hazards, including ways to eliminate or protect against those hazards
- method of audible warning/alert and required response by the roadway worker
- protocol for work plan changes
- identification of minimum warning times established for providing employees sufficient time to take action in response to the warning (see Appendix A)
- designated place of safety/safe clearance location
- information about any tracks adjacent to the track to be fouled, on-track safety for such tracks, if required, and identification of any roadway maintenance machines that will foul such tracks
 - In such cases, the on-track safety briefing shall address the nature of the work to be performed and the characteristics of the work location.
- means of communication to be used at the site
- PPE requirements
- method of train approach warning
- designated responsibilities in the event of an emergency
- notification responsibilities
- location of emergency egress

All roadway workers involved in the work shall be included in the job safety briefing.

A job briefing for on-track safety shall be deemed complete only after all roadway workers have acknowledged an understanding of the on-track safety procedures and instructions presented.

APTA RT-OP-S-016-11, Rev. 2
Roadway Worker Protection Program Requirements

The rail transit agency shall require pre-work briefings to be documented. It shall require all workers to demonstrate understanding and acknowledgment of the working conditions identified in the pre-work briefing. This may be a form or similar document that describes the work and includes space for employee signatures.

For rail transit agencies that allow lone workers to access the ROW, the agency shall require that each lone worker shall communicate at the beginning of each duty period with a supervisor or another designated employee to receive a job briefing and to advise of their planned itinerary and the procedures that they intend to use for on-track safety. The agency shall identify any requirements associated with such a notification, such as means of recording or documenting the communication.

1.6 On-track safety rules and procedures

1.6.1 General

The on-track safety program shall require every roadway work group whose duties require fouling a track to have one roadway worker designated by the rail transit agency who is responsible for establishing on-track protection for all members of the group. The designated person (the QPE, sometimes referred to as the roadway worker in charge, or RWIC, which may also be a separate individual) shall be qualified under the rules of the agency to provide the protection necessary for on-track safety of each individual in the group.

At rail transit agencies where this is applicable, the on-track safety program shall provide procedures for lone workers to achieve on-track safety.

1.6.2 Working limits

The on-track safety program shall provide procedures to establish working limits that afford on-track safety to roadway workers. Working limits established under any procedure shall conform to the following provisions:

- Access shall be granted in accordance with the rail transit agency's track allocation requirements (see also Section 2 of this standard and the related APTA standard "Rail Transit System Track Allocation Program Requirements").
- Only a roadway worker who is qualified in accordance with the rules of the rail transit agency shall establish or have control over working limits for the purpose of establishing on-track safety.
- Only one roadway worker shall have control over working limits on any one segment of track. The rail transit agency shall determine how to assign responsibilities if multiple crews are working in a shared or adjacent area via piggybacking.
- All affected roadway workers shall be notified before working limits are released for the operation of trains. Working limits shall not be released by the QPE until all affected roadway workers either have left the track or have been afforded alternate means of on-track safety in accordance with the rules of the rail transit agency.

1.6.3 Establishing working limits on controlled tracks using exclusive track occupancy

The on-track safety program shall provide procedures for establishing working limits on controlled tracks through the use of exclusive track occupancy procedures that comply with the following requirements:

1. The track within working limits shall be placed under the control of one roadway worker by:
 - authority issued to the QPE by control center personnel who control train or other on-track equipment movements on that track; or

APTA RT-OP-S-016-11, Rev. 2
Roadway Worker Protection Program Requirements

- flagpersons stationed at each entrance to the track within working limits and instructed by the QPE to permit the movement of trains and equipment into the working limits only as permitted by the QPE; or
 - the QPE causing fixed signals or train control systems to restrict the movement of vehicles.
2. An authority for exclusive track occupancy given to the QPE in charge of the working limits shall be documented in writing or via agency-designated electronic means. It shall be issued by oral communication to the roadway worker by control center personnel in charge of the track.
 - Where authority for exclusive track occupancy is transmitted orally, the authority shall be repeated back to the issuing employee by the QPE for verification.
 - The QPE in charge of the working limits shall maintain possession of the written or printed authority for exclusive track occupancy while the authority for the working limits is in effect.
 - Control center personnel in charge of the track shall make a written or electronic record of all authorities issued to establish exclusive track occupancy.
 3. The territory included in the working limits shall be defined by one of the following clearly identifiable physical features:
 - a flagperson with instructions and capability to hold all trains and equipment clear of the working limits;
 - a fixed signal that displays an aspect indicating “Stop”;
 - a station identified by name with a sign;
 - a clearly identifiable milepost sign; or
 - a clearly identifiable physical location prescribed by the operating rules of the rail transit agency that trains may not pass without proper authority.
 4. Movements of trains and roadway maintenance machines, or other on-track equipment within working limits established through exclusive track occupancy, shall be made only under the direction of the roadway worker having control over the working limits. The on-track safety program shall specify the speed of such movements. See the APTA standard “On-Track Equipment Safety Requirements” for additional information.

1.6.4 Establishing working limits on controlled tracks using foul time

The on-track safety program may provide procedures for establishing working limits on controlled tracks through the use of foul time or a similar procedure that complies with the following requirements:

- Permission to foul a designated track section may be given orally and/or in writing by control center personnel only after that employee has withheld the authority of all trains to move into or within the working limits during the foul time period.
- Each roadway worker to whom such authority is issued shall repeat the track number, track limits and time limits of the foul time to the issuing employee for verification before the foul time becomes effective.
- Control center personnel shall not permit the movement of trains or other on-track equipment onto the working limits protected by foul time until the roadway worker who obtained the foul time has reported that all roadway workers, equipment and tools are clear of the track.

1.6.5 Establishing on-track protection on non-controlled tracks

The on-track safety program shall provide procedures for establishing working limits on non-controlled tracks (e.g., non-sigaled tracks in yards or on sidings, extensions not yet opened, track with failed signal systems) that comply with the following requirements:

- Working limits on non-controlled track shall be established by rendering the track within working limits physically inaccessible to trains and other on-track equipment at each possible point of entry. The rail transit agency shall define the methods by which the track can be made inaccessible.

APTA RT-OP-S-016-11, Rev. 2
Roadway Worker Protection Program Requirements

- Trains and roadway maintenance machines within working limits established by means of inaccessible track shall move only under the direction of the QPE in charge of the working limits, and shall move at a speed specified by the rail transit agency.
- No operable locomotives or other items of on-track equipment, except those moving under the direction of the QPE in charge of the working limits, shall be located within working limits established by means of inaccessible track.

1.6.6 On-track protection outside working limits

An on-track safety program shall include procedures for establishing protection outside the working limits for roadway workers in a work group who foul any track:

- Warning shall be given by the watchperson/lookout in sufficient time to enable each roadway worker to move to and occupy a previously arranged place of safety before a train or other on-track equipment moving at the maximum speed authorized on that track can pass the location of the roadway worker. The rail transit agency shall calculate the distance and time requirements for roadway workers to safely clear to a place of safety with trains or other OTE moving at maximum authorized speed, but no less than 15 seconds. The agency shall define what constitutes a place of safety for the purposes of workers clearing to allow train movement through or past a work area.
- Watchpersons/lookouts assigned to provide train-approach warnings shall devote full attention to detecting the approach of trains and communicating a warning, and shall not be assigned any other duties while functioning as watchpersons/lookouts.
- The means used to warn of the approach of a train or on-track equipment shall be distinctive and shall clearly signify to all recipients the warning that a train or other on-track equipment is approaching. Such protection must be detectable by the warned roadway worker regardless of noise or distraction of work.
- Every roadway worker who depends upon such protection for on-track safety shall maintain a position that will enable them to receive a train or other on-track equipment approach warning communicated by a watchperson/lookout at any time while on-track safety is provided by train or other on-track equipment approach warning.
- A warned roadway worker shall clear to a place of safety and acknowledge oncoming train(s) or other on-track equipment, using agency-established methods of acknowledgment.
- Every roadway worker who is assigned the duties of a watchperson/lookout shall first be trained, qualified and designated by the employer to do so.
- Every watchperson/lookout shall have in their possession the equipment necessary for compliance with the on-track safety duties that the watchperson/lookout will perform.
- If such protection is provided by technological means, all roadway workers in the work group shall be trained on the operation of such devices and acknowledge familiarity with those procedures.
- An adjacent track without adequate protection cannot be considered a place of safety.

1.6.7 On-track safety procedures for lone workers

For rail transit agencies where this is applicable, an on-track safety program shall include procedures for establishing protection for lone workers in accordance with the following provisions:

- A lone worker who fouls a track while performing routine inspection or minor correction may use individual train detection (ITD) to establish on-track safety only where permitted by this section and the on-track safety program of the rail transit agency.
- A lone worker shall be allowed to use on-track safety procedures other than ITD, if permission to do so is contained in agency procedures.

APTA RT-OP-S-016-11, Rev. 2
Roadway Worker Protection Program Requirements

- ITD may be used to establish on-track safety only under conditions to be defined by the rail transit agency. The agency shall prohibit ITD when the ability of the lone worker to hear and see approaching trains and other on-track equipment is impaired. Under those conditions, another form of protection shall be used; however, these procedures must be explicitly outlined in writing and the appropriate level of training provided to maximize the safety of all involved. Background noise, lights, visibility, passing trains or any other physical conditions should be considered.
- The place of safety to be occupied by a lone worker upon the approach of a train or other on-track equipment may not be on a track, unless working limits are established on that track.
- A lone worker using ITD for on-track safety while fouling a track may not occupy a position or engage in any activity that would interfere with that worker's ability to maintain a vigilant lookout for, and detect the approach of, a train or other on-track equipment moving in either direction as prescribed in this section.

1.6.8 Other roadway protection considerations

Protective measures are required for train or other on-track equipment operation for trains approaching and passing roadway workers engaged in maintenance or inspection activities outside working limits.

The individual rail transit agency shall determine if additional roadway worker protective measures are required for train or other OTE operation within single track line sections, when trains or other OTE are operating against the normal direction of movement, or for trains approaching and passing roadway workers engaged in maintenance or inspection activities outside working limits but near active track. If the individual agency determines that additional protective measures are required, then the specific measures shall be included in its on-track safety program.

For specific requirements concerning on-track equipment safety, refer to the APTA standard "On-Track Equipment Safety Requirements."

The rail transit agency shall determine if additional protective measures are required, and if so, the agency shall include the specific measures in its on-track safety program.

The agency shall develop and implement roadway worker protective measures when operating a driverless system, such as an automated people mover (APM).

The rail transit agency shall determine if unique protections or measures are required for the different types of street operation, and the agency shall develop and implement protective measures specific to these different conditions.

1.7 Audible warning and hand signals

Rules/procedures for audible warnings and hand signals, as defined by the rail transit agency, shall be developed to enable communication and provide protection between train or OTE operators and roadway workers.

The on-track safety program shall require an audible warning from approaching trains and on-track equipment. Such warning shall not substitute for other on-track safety procedures prescribed in this standard.

The roadway worker or flagperson shall acknowledge the audible warning using agency-established methods of acknowledgment. Hand signals for "Stop," "Proceed" or "Reduce speed" can be used by the flagperson to acknowledge the audible warning.

The on-track safety program shall define the actions of the train or other on-track equipment operator, should the audible warning not be acknowledged.

1.8 On-track equipment

An on-track safety program shall include provisions for the safety of roadway workers who operate or work near OTE. Those provisions shall address the following:

- training and qualification of operators of roadway maintenance equipment/machines
- establishment and issuance of safety procedures both for general application and for specific types of equipment/machines
- communication between machine operators and roadway workers assigned to work near or on roadway maintenance equipment/machines
- spacing between machines to prevent collisions
- spacing between machines and roadway workers to prevent personal injury
- maximum working and travel speeds for equipment/machines dependent upon weather, visibility and stopping capabilities
- the safe operation of such equipment/machines where trains or other on-track equipment/machinery is passing on adjacent tracks

APTA RT-OP-S-021-14, “On-Track Equipment Safety Requirements,” contains detailed requirements and provisions for the design and safe use of OTE.

1.9 Secondary warning methods and use

The rail transit agency may develop a method of redundant protection and/or warning for approaching train movement at any work location:

- manual/physical—e.g., flagging or additional staff that serve as an additional layer on top of the primary protections referenced in Section 1 of this standard
- electronic methods
- other options, as determined by the rail transit agency

1.10 Minimum clearance

The rail transit agency shall formally identify how it depicts minimum clearances and the expectations for roadway workers at or near minimum clearance areas. Methods may include but are not limited to the following:

- no-clearance markings
- no-clearance location book or guide
- established criteria for no clearance zones/locations

1.11 Access for unqualified individuals on the ROW

Some rail transit agencies may grant limited access to outside individuals who are not qualified to be RWP trained but who must still follow various safety requirements. In any case, individuals must be escorted by trained agency personnel who understand the specific requirements of the escorting duty. The agency shall establish requirements regarding access for non-RWP-trained personnel.

2. Supervision and control

2.1 Introduction

This section addresses the duties of the rail transit agency to establish roadway access/allocation and control measures, work zone protection and verification processes, and standard communication protocols.

Prior to authorizing entry into the roadway or for wayside work activities to commence, the rail transit agency shall have procedures to ensure that all appropriate safeguards have been established in accordance with existing rules and procedures and the established work plan.

The agency shall establish adequate internal procedures and control mechanisms to ensure safety during maintenance, construction, testing, inspection and repair activities that have the potential of fouling a track.

2.2 Establishment and notification of roadway allocation

The rail transit agency shall establish procedures for track allocation that provide the level of protection required by Section 1 of this standard. These procedures shall include a process for notification of all affected parties. These procedures shall address, at a minimum, planned work on the roadway or adjacent to the roadway. See APTA RT-OP-S-020-13, “Rail Transit System Track Allocation Program Requirements.”

2.3 Supervision and control responsibilities

2.3.1 Roadway access and control measures

The rail transit agency shall establish internal procedures and control mechanisms that address the following elements:

- planned work on the roadway or adjacent to the roadway
- unplanned or emergency work
- mobile inspections or mobile work crews
- lockout/tagout procedures/practices for work performed on any segment of automated/driverless systems to prevent movement of such vehicles into a fouled area of the right-of-way

2.3.2 Authorization and tracking processes for right-of-way access

The rail transit agency shall adopt and implement a formal process for authorizing entry into the rail right-of-way, including controlled and non-controlled tracks.

The agency shall maintain the status of active/occupied track access.

2.4 Communications

The rail transit agency shall develop and implement standard communications protocols governing the establishment, protection and management of roadway worker activities.

2.4.1 Methods of notification

The rail transit agency shall determine the method of notifying other parties of roadway worker activities that affect their duties. Methods of notification necessary to enhance safety could include the following:

- paper forms
- radio transmissions
- physical field devices (signs or other devices)

APTA RT-OP-S-016-11, Rev. 2
Roadway Worker Protection Program Requirements

- authorized electronic devices
- other methods to be determined by the rail transit agency

2.4.2 Authorization/notification communication requirements

The rail transit agency shall establish requirements for the QPE to obtain authorization from the control center personnel who control train or other on-track equipment movements on that track prior to entering the roadway.

Control center personnel shall inform the roadway worker of any hazards or other conditions that could affect track access.

The rail transit agency shall establish requirements for the QPE to notify the control center personnel who control train or other on-track equipment movements on that track after all work crews have reported clear of the roadway.

2.5 Rules compliance program

The rail transit agency shall implement a compliance program for the oversight of on-track protection in accordance with the structure described in APTA RT-OP-S-011-04, “Rule Compliance Program Requirements.”

2.6 Record-keeping

The rail transit agency shall establish a program for keeping appropriate safety records of workers on the roadway and their compliance with the roadway worker protection program. The agency shall determine and document the record retention timeline. At a minimum, records shall include the following:

- roadway worker (including contractors) training and certification
- rules compliance
- track allocation records
- traction power energization/de-energization records, if applicable
- Operations Control Center logs, if applicable

3. Training

3.1 Training program

The rail transit agency shall implement a roadway worker protection training program that applies to roadway workers working on or near the right of way. This program shall include initial and requalification training. As part of this training program, the rail transit agency shall, at a minimum, do the following:

- Identify the dangers on the roadway, including moving trains, the traction power system and known hazardous conditions.
- Identify the tasks roadway workers are required to perform in order to successfully perform their duties.
- Identify the skills and knowledge necessary to perform each of the tasks identified.
- Establish standards for the successful completion of initial and requalification training.
- Establish proficiency requirements for RWP qualification.
- Designate qualifications of training staff.
- Require all roadway workers to successfully complete all required training.
- Periodically review all training initiatives.

APTA RT-OP-S-016-11, Rev. 2
Roadway Worker Protection Program Requirements

- Require first-line supervisors and other supervisors as defined by the rail transit agency to complete the program that covers the employees they supervise.
- Train supervisors to exercise oversight to ensure that all the identified tasks are performed in accordance with the rail transit agency's written procedures (this can be done as part of general supervisory training).
- Include in training programs for train operators and control personnel the RWP rules and procedures particular to their duties.
- Incorporate into revised RWP training programs any input of lessons learned from past experiences of the rail transit agency and the industry.

The rail transit agency shall determine how roadway worker protection training is provided to train operators, dispatchers/controllers, or other individuals who operate or manage operation through work zones. The RTA may incorporate roadway worker safety rules into existing operator and controller training and may or may not require operators or controllers to participate in the specific roadway worker protection training and certification program.

3.2 Training course requirements/elements

Each rail transit agency shall adopt a training curriculum designed to impart the skills and knowledge identified as necessary to safely implement the awareness/tasks required by the agency's written RWP policies and procedures.

3.2.1 Training course minimum requirements

Minimum requirements of the training course should include the following, where applicable:

- various methods used by the rail transit agency to establish on-track protection
- responsibilities of each roadway worker relative to each method of establishing on-track protection used by the agency
- personal protective equipment
- prohibitions
- agency requirements on personal electronic device use
- general personal precautions while working on the right-of-way
- communications between train operators, other employees on-site and the control center
- physical characteristics of the right-of-way
- characteristics of moving trains, including but not limited to dynamic envelope and line of sight of oncoming or passing trains and/or OTE
- interfacing with train or other on-track equipment movements
- highway vehicle traffic considerations
- removal/restoration of traction power
- policies, procedures and rules unique to the specific rail transit agency
- responsibilities for lookout/flagperson/protection of work crews
- hand signals for trains
- hazards
- lessons learned

3.2.2 Requalification/return-to-work training

The rail transit agency shall establish a standard for when requalification will take place, with the recommended interval not to exceed at least once every calendar year.

3.2.3 Record-keeping

The rail transit agency shall maintain records of all roadway workers trained and qualified to perform roadway worker duties. Such records shall be made available upon request of the proper authority.

4. Hazard assessment/safety risk assessment

The rail transit agency shall employ methods whereby changes made to rules, procedures, practices, vehicles, systems or infrastructure that could have an impact on roadway worker safety are considered for their impacts on the RWP program.

5. Technology

Rail transit agencies should encourage the development and implementation of new technologies to further enhance roadway worker protection programs.

The rail transit agency shall consider one or more of the technologies available as a backup or overlay to improve its roadway worker protection program. However, APTA makes this recommendation with these very strong caveats:

- Use the technology in addition to—not in place of—the established RWP rules and procedures until such technology is proved to be superior to existing practices.
- Technology should be failsafe so as to not introduce additional hazards in the event of system failure.
- Do not employ the technology in a way that would put workers at risk in the event of a failure of the technology.
- Engage roadway workers and other rail transit agency personnel for input in the concept of design and implementation of any technology to ensure its effective implementation and use.
- Conduct a hazard analysis, and thoroughly test and evaluate the performance of the technology in the specific physical and operating environments of the rail transit agency.
- Evaluate the costs and benefits of various options as they apply to the unique environment of the individual rail transit agency.

Related APTA standards

APTA RT-OP-S-004-03, “Work Zone Safety Practices”

APTA RT-OP-S-010-04, “Contractor’s Responsibility for Safety on the Right-of-Way”

APTA RT-OP-S-011-04, “Rule Compliance Program Requirements”

APTA RT-OP-S-020-13, “Rail Transit System Track Allocation Program Requirements”

APTA RT-OP-S-021-14, “On-Track Equipment Safety Requirement”

APTA RT-OP-RP-026-20, “Roadway Worker Near-Miss Reporting Requirements”

Definitions

control center: The facility where rail operations such as train control, train dispatching, train supervision and related field activities are directed for the entire rail transit system or for specific segments of a system if there is more than one such facility.

contract operator: A contractor who operates and/or maintains the assets of the rail transit agency.

controlled track: Track upon which the rail transit agency’s operating rules require that all movement of trains must be authorized by control center personnel.

employee: Anyone the rail transit agency employs, either directly or by operating contract.

employer: A rail transit agency, or contractor to a rail transit agency, which directly engages or compensates individuals to perform any of the duties defined in this standard.

exclusive track occupancy: A method of establishing working limits on controlled track in which movement authority of trains and other equipment is withheld by control center personnel or restricted by flagpersons.

flagperson: When used in relation to roadway worker safety, an employee designated by the rail transit agency to direct or restrict the movement of trains past a point on a track to provide on-track safety for roadway workers.

foul time: One method of establishing working limits on controlled track in which a roadway worker is notified by control center personnel that no trains will operate within a specific segment of controlled track until the roadway worker reports clear of the track.

fouling a track: The placement of an individual or an item of equipment in such proximity to a track that the individual or equipment could be struck by a moving train or other on-track equipment, or in any case is within a distance determined by the rail transit agency.

inaccessible track: A method of establishing working limits on non-controlled track by physically preventing entry and movement of trains and equipment.

individual train detection (ITD): A procedure by which a lone worker acquires on-track safety by seeing approaching trains or on-track equipment and leaving the track before its arrival.

lone worker: An individual roadway worker who is not being afforded on-track safety by another roadway worker, who is not a member of a roadway work group, and who is not engaged in a common task with another roadway worker.

APTA RT-OP-S-016-11, Rev. 2
Roadway Worker Protection Program Requirements

non-controlled track: Track upon which trains are permitted by rail transit agency rule or special instruction to move without being under an automatic train control system or receiving authorization from control center personnel.

non-roadway worker: An employee of a rail transit agency, or a contractor or consultant to a rail transit agency, who is not involved in the maintenance, construction, repair or inspection of an agency rail facility but whose duties require fouling a track.

on-track equipment (OTE): A rail-mounted vehicle or equipment that is not used in revenue service but is used to inspect, maintain and repair the rail system.

on-track safety: The practice of working in a manner that will minimize the danger of being struck by a moving rail transit agency train or on-track equipment, provided by operating and safety rules that govern track occupancy by personnel, trains and on-track equipment.

place of safety: A location or condition that protects a worker from a train or other on-track equipment.

Public Transportation Agency Safety Plan: A document developed and adopted by the rail transit agency describing its agency-wide safety management system. It includes four core elements: safety policy, safety risk management, safety assurance and safety promotion.

qualified: A status attained by an employee who has successfully completed any required training for, has demonstrated proficiency in, and has been authorized by the employer to perform the duties of a particular position or function.

qualified protection employee (QPE): An individual trained and qualified on on-track safety and operating rules and assigned the responsibility of providing on-track protection. A rail transit agency may use another term for the person in this position.

rail transit agency: The organization that operates rail transit service and related activities. Also known as *transit system, transit agency, operating agency, operating authority, transit authority* and other similar terms.

roadway: Owned property of the rail transit agency within the controlled area, as defined by the agency, often referred to as *right-of-way*.

roadway work group: Two or more roadway workers organized to work together on a common task.

roadway worker: Any employee of a rail transit agency, or a contractor to a rail transit agency, whose duties include inspection, construction, maintenance or repair of agency track, bridges, roadway, signal and communication systems, electric traction systems, roadway facilities, or roadway maintenance machinery on or near track or with the potential of fouling a track, and other personnel directly involved with their protection, such as flagpersons and watchpersons/lookouts.

train: A rail mounted vehicle that is used or intended to be used in revenue service.

train approach warning: A method of establishing on-track safety by warning roadway workers of approaching trains or on-track equipment.

train operator: An authorized onboard employee who controls the movement of a train.

APTA RT-OP-S-016-11, Rev. 2
Roadway Worker Protection Program Requirements

watchperson/lookout: An employee who has been trained and qualified to provide warning to roadway workers of approaching trains or on-track equipment.

working limits: A segment of track with definite boundaries upon which trains and/or on-track equipment may move only as authorized by the roadway worker having control over that defined segment of track.

Abbreviations and acronyms

- APM** automated people mover
- ATO** automatic train operation
- FRA** Federal Railroad Administration
- FTA** Federal Transit Administration
- ITD** individual train detection
- NTSB** National Transportation Safety Board
- OTE** on-track equipment
- PTASP** Public Transportation Agency Safety Plan
- QPE** qualified protection employee
- ROW** right-of-way
- RWIC** roadway worker in charge
- RWP** roadway worker protection

Document history

Document Version	Working Group Vote	Public Comment/ Technical Oversight	Rail CEO Approval	Policy & Planning Approval	Publish Date
First published	April 2010	2nd quarter 2011	2nd quarter 2011	October 2011	Nov. 1, 2011
First revision	Sept. 26, 2014	Sept. 15, 2015	Jan. 7, 2016	Sept. 30, 2016	Oct. 6, 2016
Second revision	March 28, 2023	May 31, 2023	July 21, 2023	August 4, 2023	August 16, 2023

Appendix A: Train approach warning chart examples

Many rail transit agency have developed train approach warning charts, which indicate a train’s speed and the distance it travels in different periods of time, as a means of helping roadway workers understand train operating dynamics and their impact on the work zone. **Figure 1** is an example chart from the Charlotte Area Transit System.

FIGURE 1
 Train Approach Warning Chart

M P H	Feet Per Second	Feet In 25 Seconds	M P H	Feet Per Second	Feet In 25 Seconds
5	7.4	185	35	51.3	1,283
10	14.7	367	40	58.7	1,467
15	22.0	550	45	66.0	1,650
20	29.3	733	50	73.3	1,833
25	36.7	917	55	80.7	2,017
30	44.0	1,100	60	88.0	2,200