



METROLINX SAFETY DIVISION

Worksite Protection Planning with Temporary Automatic Track Warning Systems (ATWS)

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Record of Revisions

This standard will be reviewed within 3 years of the date of issue; the review can be undertaken sooner in the event of advancement of ATWS technologies or changes in operational requirements.

Date	Initiated by	Revision History	Revision
November 15 2024	Shaun Kearney	Initial	1.0

List of Acronyms

Acronym	Meaning
ATWS	Automatic Track Warning System
CROR	Canadian Rail Operating Rules
GBO	General Bulletin Order
GEI	(Metrolinx) General Engineering Instructions
NOC	Network Operations Control
RCAC	Rail Corridor Access Control
RTC	Rail Traffic Controller
TDT	Technical Design Team
TMO	Technical Management Office
USRC	Union Station Rail Corridor

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Reference Documentation

Document
Canadian Rail Operating Rules
Metrolinx GEI
Metrolinx MX-RCAC-STD-001
Metrolinx Work Plan Methodology Template User Manual (CPG-PGM-MAN-278)

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Applicable Terms

Term	Definition
ATWS Component	A device forming part of the ATWS (e.g., a train detector, warning unit)
Collective Warning Device	A device (typically set up beside the track) which uses audible and visual alarms to alert a group of trackworkers to an approaching train.
Disruptive Access	Rail Corridor Access that requires adjusted train routing, modified train schedules, reduced Train Movements, and/or cancelled Train Movements including but not restricted to GO revenue services and other Rail Operations. <i>(From Metrolinx MX-RCAC-STD-001)</i>
Foreman	A person in charge of the Track Protection and track units. <i>(From Metrolinx MX-RCAC-STD-001)</i>
Individual Warning Device	A body-worn device which uses audible, visual and tactile alarms to alert an individual trackworker to an approaching train.
Track Protection Provider	An organization providing protection services for its own works and/or offering protection services for the works of other organizations
Safety Watch	A form of protection where an employee oversees a group of employees/workers, where no form of positive protection is in place and required sightline distances and procedures must be followed. <i>(From Metrolinx GEI)</i>
System Supplier	An organisation supplying the ATWS system (including Operational Safety Case, documentation and support) to the Track Protection Provider
Watch Person	An Employee assigned to warn of an approaching Movement to personnel working under Safety Watch protection. <i>(From Metrolinx GEI)</i>
Works Planner	A certified individual who designs or checks a Worksite Protection Plan.
Worksite Protection Plan	A document stating how a worksite will be protected using ATWS.

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1.0 Purpose

This standard describes the process of worksite protection planning with temporary Automatic Track Warning Systems (ATWS) used on Metrolinx railway infrastructure.

The appropriate process for ensuring worker safety will be determined by the Hierarchy of Control. This standard will apply where using a risk based approach it is determined the need for a process which requires trackworkers to receive a warning of approaching trains. The ATWS is meant as a supplemental safety tool to support other forms of protection.

The purpose of this standard is to improve trackworker safety by reducing the risk of human error in protection arrangements for staff working on or near the tracks which remain open to traffic, when compared to lower levels of the hierarchy of controls. It specifies how a certified Works Planner will prepare a Worksite Protection Plan describing how ATWS will be deployed to automatically detect trains approaching a worksite and to clearly alert the workers in the worksite with sufficient time for them to move to a place of safety prior to the train arriving at the worksite.

2.0 Scope

This standard:

- is applicable on all Metrolinx infrastructure, with the exception of the Union Station Rail Corridor (USRC), where alternative forms of protection will be used due to the complexity of the track layout, unless location-specific risk assessment exceptionally demonstrates that temporary ATWS may be used.
- is only applicable to temporary ATWS systems (as opposed to permanently installed ATWS systems with a direct interface to the signalling system) .
- is primarily intended to be used for work that requires Disruptive Access as defined in MX-RCAC-STD-001.

3.0 Process

The temporary ATWS system will be owned, operated, and maintained by the Track Protection Provider employed by Metrolinx in the same manner as other devices used to achieve protection in accordance with the manufacturers manual.

The Track Protection Provider will engage certified ATWS Works Planners (either through employment or by contract) to prepare and check ATWS Worksite Protection Plans describing how the ATWS system will be deployed. The Track Protection Provider will submit these plans through the Network Access Planning Tool in accordance with the Work Plan Methodology Template User Guide (CPG-PGM-MAN-278). The timescales for submitting these plans will be in compliance with the planning requirements for RCAC.

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3.1 Description of a Temporary Automatic Track Warning System

ATWS is a system to be used in addition to a form of track protection, which:

- detects trains approaching a worksite.
- determines what alert is required for the approaching train, and when that alert should be given.
- gives workers an appropriate alert using their centrally mounted (“collective warning device”) or personally worn audible, visual and tactile alarms (“individual warning devices”).

It is designed to a sufficient level of integrity that if the system fails, it fails to a safe state.

It is comprised of temporarily deployed components which can be safely and efficiently set up and tested prior to the commencement of work, and rapidly removed following the completion of the work. Note that a separate form of protection (e.g., Safety Watch) may be needed to protect the trackworkers setting up, testing and removing the ATWS system. This setup and removal is not covered by the Worksite Protection Plan and requires its own workplan to setup prior to work beginning; it is the Foreman’s responsibility to ensure that an effective form of protection is selected (ideally during white periods) and is put in place.

3.2 Worksite Protection Plans

The safety of trackworkers protected by a form of track protection using an ATWS system relies upon the correct positioning and configuration of the ATWS system, in combination with additional operational controls (e.g., Temporary Slow Order). These arrangements are specific to the geography, environmental conditions, and nature of work on each site, and will be clearly defined in a Worksite Protection Plan for each specific deployment of an ATWS system. Production of a Worksite Protection Plan is a safety-critical activity.

The ATWS Worksite Protection Plan will be designed by the Track Protection Provider’s Works Planner and checked by a second senior Works Planner prior to being issued to the Foreman who will be operating the ATWS. Upon receiving the Worksite Protection Plan, the Foreman will:

- independently check the plan is appropriate for the works to be undertaken
- ensure that the equipment required will be available in a good state for use.
- undertake a preliminary site visit to ensure that the locations for ATWS components are appropriate and practicable, and to verify radio connectivity is achievable.

Should the Foreman have any concerns about the ability of the plan to provide protection to the trackworkers, they will raise these concerns in writing with the Works Planner and agree on a resolution. When the Foreman considers the plan to be acceptable, they will confirm this in writing. No Works Protection Plan will be implemented unless the Foreman has confirmed acceptance of that plan in writing.

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If it is not possible to develop a Worksite Protection Plan that is acceptable to the Foreman using temporary ATWS, the Foreman and Works Planner shall select a higher level of worksite protection arrangements from the Hierarchy of Controls.

Once the Worksite Protection Plan has been produced by the Works Planner, checked by a second Works Planner and accepted by the Foreman, the Works Planner will submit these plans through the Network Access Planning Tool in accordance with the Work Plan Methodology Template User Guide (CPG-PGM-MAN-278).

The ATWS Worksite Protection Plan will specify:

- the scope of protection (i.e., what activities can be undertaken, where, how, when and by who under this plan)
- the placement of all devices to ensure all trains are detected, all staff are warned, and the Foreman has situational awareness; this will be primarily achieved through a dimensioned markup on a track diagram
- the configuration of the ATWS system
- any restrictions of railway operations (e.g., Temporary Slow Order, spike and locking of switches out of use) and how these will be implemented.
- the site briefing content to be delivered to trackworkers: what warnings will be given for each train movements (including adjacent track movements) and when.
- a copy of the text agreed with the RTC or NOC to be included in the relevant bulletins/GBO.
- the names of the Works Planners who designed and checked the plan.

3.2.1 Production of Worksite Protection Plans

The Works Planner will identify:

- the location and duration of the worksite
- the characteristics of the track around the worksite (including photographic mapping, track diagrams, hazard logs and radio propagation).
- the nature of rail traffic through that site (type/speed/frequency of train movements)
- the nature of works to be undertaken.
- the nature of track protection required.
- the environmental conditions under which the works will be undertaken.
- the availability of accessible places of safety
- how the trackworkers will access and exit the site.

The Works Planner will conduct a site visit to provide missing information if inadequate records are available for any of these considerations. The Works Planner will liaise with

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the Foreman who will be responsible for the worksite to ensure a complete understanding of the nature of works to be undertaken, and where necessary the Foreman will accompany the Works Planner on the site visit.

The Works Planner will confirm that the nature of protection requested is appropriate to the works to be undertaken.

It is possible that the nature of works, and location of the worksite could change during the duration of the works. The Works Planner will need to decide if the works can be covered by a single Worksite Protection Plan (e.g., a worksite with a moving workforce e.g., vegetation management) or whether multiple Worksite Protection Plans would more clearly convey the requirements.

For complex works the Works Planner may choose to:

- include a Hazard Analysis in the Worksite Protection Plan to identify the significant hazards associated with performing the scope of work at the worksite location so that it can be shown how the proposed method of protection and application of ATWS addresses these hazards.
- consult with the Metrolinx Director Integration Program Technical.

The Works Planner will:

- Identify the required warning times and warning distances to comply with both the Metrolinx GEI and CROR planning and protection standards and processes.
- Identify how the ATWS system can provide the necessary warning times and warning distances through application of the System Supplier's documentation. This includes:
 - the positioning of train detection devices.
 - Train detection devices will be placed such that unnecessary alerts (e.g., due to trains diverging into another track or subdivision between the detection point and the worksite, or reversing after passing the detection point) are avoided. The Works Planner will consider all operational scenarios including degraded/emergency modes of operation when determining the layout of train detection devices.
 - the deployment of collective and individual warning devices.
 - All ATWS components will be located in places of safety unless their function requires them to be fixed to the track.
 - the configuration of the system.
 - the positioning of facilities for the Foreman to maximize their situational awareness.
 - the provision of reliable communications between the ATWS system components.
- Identify how the warnings will be passed to the trackworkers e.g., in noisy environments, specifying the use of individual warning devices, or at nighttime

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close to dwellings, specifying the use of reduced audible warning volume or visual warnings only. Where necessary, the Works Planner will liaise with the Metrolinx Public Relations department so that the noise impact can be communicated to local residents.

- Calculate an estimate of the total time that the worksite would be productive, using the formula:

Total worksite access time – time to set-up /remove ATWS – time responding to ATWS train alerts

- Calculate an estimate of the proportion of time that the worksite would be productive, considering the method of protection chosen by the hierarchy of control and using the formula:

$$\frac{\text{Total worksite productive time}}{\text{Total worksite access time}}$$

- Consider if there are any risks of trackworkers having to remain in a position of safety waiting for trains to pass the worksite for excessive periods of time, and identify how these risks will be managed.
- Consider if operational restrictions (e.g., Temporary Slow Orders, spike and locking of switches, locking out reverse movements) could be applied to simplify the ATWS provision (reduced set-up/removal time and reduced warning time) at the expense of reduced operational capacity/flexibility and increased journey time. Optimizing this balance requires iteration of potential protection solutions; the Works Planner will need an understanding of:
 - the scope of the works and productive time required.
 - the ability to complete the works within the worksite productive time.
 - The capacity constraints on the section of track affected by the works.
 - the criticality of journey times (e.g., passenger services vs freight services)
- Document how operational restrictions would be applied (e.g., nature and location of signage, which switches will be secured and how this will be achieved)
- Identify, using the maximum duration of the works and the runtime guidance in the System Supplier's documentation, the number and type of spare batteries that will be required to ensure the ATWS system can operate for the full duration required. A further spare battery of each type to be used will be added to the schedule of batteries to be taken to site.
- Arrange for a second Works Planner to:
 - Review the input information and Worksite Protection Plan for compliance with CROR standards, Metrolinx Standards and this standard.
 - Consider whether an alternative approach to protection would lead to an improvement in safety and efficiency or a reduction in complexity.
 - Check the Worksite Protection Plan for arithmetical, logical and grammatical errors and ensure that the information given is clear and unambiguous.

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- Review this proposed protection plan with the party requesting protection to ensure that it meets their needs and amend the plan if required.
- Submit the proposed protection plan to RCAC for approval and amend the plan if required.

Work Plan for ATWS Setup must be provided to the Flagging Provider at least 24 hours in advance of the work to allow Foreman to review prior to the shift.

- Write operational briefings for:
 - the Foreman
 - trackworkers
 - RTC or NOC to support the issuance of a GBO.
- Sign the Worksite Protection Plan as "Designed".
- Arrange for a second ATWS Works Planner to:
 - Review the Operational Briefings
 - Sign the Worksite Protection Plan as "Checked".

Should the Works Planner who produced the Worksite Protection Plan have produced fewer than three Worksite Protection Plans since initial certification as a Works Planner, the second Works Planner should have at least a year's experience since certification as a Works Planner.

3.2.2 Library of ATWS Worksite Protection Plans

The Track Protection Provider will maintain a library of previously approved Worksite Protection Plans for the area in which they operate, for use as an unwarranted reference source for the Works Planners (e.g., when preparing Worksite Protection Plans for regularly undertaken activities) to improve the efficiency of Worksite Protection Plan production. Reference to previously approved plans does not allow any of the production steps described in this standard to be omitted as the environment could have changed since the previous Worksite Protection Plan had been approved. **It is the Works Planner's responsibility to ensure that the Worksite Protection Plan is fully accurate and compliant for the proposed works in the proposed location in the proposed conditions even if some of the material in that plan has been sourced from the Library of ATWS Worksite Protection Plans.**

3.3 Training of ATWS Works Planners

The Track Protection Provider will ensure that any person acting as the ATWS Works Planner has been trained and certified as competent to do so. This training and certification will be repeated every two years to ensure that competence and familiarity with ATWS planning is maintained.

A central record of those persons who have successfully demonstrated competency in ATWS Works Planning will be maintained by the Track Protection Provider to facilitate the allocation of suitably trained resources to ATWS Works Planning activities, to ensure the

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timely arrangement of refresher training /re-assessment, and for audit by Metrolinx Safety Division.

Training and competence assessment for ATWS Works Planners will only be carried out by resources authorized by name by the Metrolinx Safety Standards and Process team.

The Works Planners will always carry a record of their competence to act as ATWS Works Planners when they are carrying out their duties. This record will take the form of a credit-card-sized human-readable certificate, which is designed to be durable in the rail working environment and resistant to unauthorized amendment, duplication or personification. It is permissible for this physical record to be combined with the records of other railway-related competencies provided that the requirements of this standard are fully met.

Prior to delivering ATWS Works Planning training, the Track Protection Provider will ensure that all delegates already:

- Hold a valid Metrolinx PTS qualification (to give an understanding of operating in the Metrolinx rail environment).
- Have completed a CROR certification course.
- Meet the Metrolinx Fit for Duty requirements.

3.4 Records Retention

All ATWS Worksite Protection Plans used will be retained until the latest of:

- 6 years after the Worksite Protection Plan was used.
- 2 years after the conclusion of investigation into any incidents occurring during use of the Worksite Protection Plan, regardless of whether the incident related to the ATWS protection or not.

All ATWS Works Planner competency records will be retained until the latest of:

- 6 years after the Works Planner competency has expired.
- 2 years after the conclusion of investigation into any incidents occurring during use of a Worksite Protection Plan produced or checked by that ATWS Works Planner, regardless of whether the incident related to the ATWS protection or not.

3.5 Audit and Standard Compliance

The Track Protection Provider will establish a schedule for periodic internal risk-based audit of their Works Planners against this standard. As well as ensuring that the processes are being followed, this should ensure that the standard is achieving its purpose of increasing safety of trackworkers through a reduction in the number of incidents and near misses. Where appropriate, changes to the standard should be identified to better achieve this purpose and proposed to the Metrolinx Safety Division.

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In the event of an allegation (from any source) that a Works Planner has failed to meet the requirements of this standard, this will be investigated by the Track Protection Provider. Should the investigation demonstrate that the Works Planner has not demonstrated competence or diligence in their work, this will be noted against the Works Planner's competence records. If the lack of competence is significant, the Works Planner will have their competence suspended until they undertaken a further competence assessment. Details of all allegations, investigations and suspensions shall be notified to the Metrolinx Safety Division.

4.0 Roles and Responsibilities

4.1 Track Protection Provider

- Train the ATWS Works Planners using materials provided by the System Supplier
- Maintain the library of protection content for Site Specific Work Plans.
- Audit compliance with the standard by Works Planners.

4.2 ATWS Works Planner

- Prepare and check protection content for Work Plan applications.
- Undertake and maintain ATWS Works Planner Program training.
- Maintain CROR Certification

4.3 Metrolinx Safety Division

- Audit compliance with the standard by Track Protection Providers, agree concessions to the standard.
- Maintain and develop standard, considering technology and environmental changes, and in response to operating experience.
- Investigate incidents (ATWS incidents are treated no differently to other incidents).