Snow and Ice Control Plan of Operations

Aviation Services

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### Version History

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De-icing area, and T1 apron
Maps
Updates from MAO to Duty Manager (ADM) titles
Added 100 m restriction of salt from guard booths

Chris Curd
Paul Atwal
George Fullerton
Danny Errett
Garry Connell

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1 Introduction

1.1 About This Document
This document describes the standards that apply to snow clearance and removal processes and ice control operations at Toronto Pearson International Airport (TPIA), including:

- The GTAA’s operating philosophy and applied methodology.
- Priorities, as they apply to all airport areas and groups.
- The responsibilities of the Greater Toronto Airports Authority (GTAA) and personnel.
- The areas of responsibility and involvement on part of agencies other than the GTAA, including contracted services.
- The functional and operational organization of the snow clearance, snow removal, and ice control operations.
- Coordination with, and interactions between, all involved parties and offices.

1.2 Who Should Use This Document
This document is intended to be read by all GTAA offices and personnel involved in snow clearance, snow removal, and ice control operations at TPIA. This includes contracted services to the GTAA performing snow removal services, as well as major air carriers operating out of TPIA. Specifically, this document, in its entirety or in part, applies to:

- Aviation Operations/Airfield Maintenance Management and Personnel
- Airport Operations Control (AOC)
- Manager, Operations Aviation Services (MO AVS)
- Airport Duty Manager (ADM)
- Apron Management Unit (AMU)
- Resource Management Unit (RMU)
- Central Deicing Facility (CDF)
- NAV Canada – Area Control Centre (ACC) and Control Tower
- Major air carriers
- Contracted weather services
2 Snow Event Operations and Customer Service Offices

2.1 Scope
This chapter provides a framework for understanding snow event operations as they are carried out at the airport, the agencies and offices involved, and defines key terminology specific to maintenance operations used throughout this document.

2.2 Overview
Unimpeded access to and from TPIA is a requirement of millions of people each year. Minimal disruption to aircraft movements and continual clearing of the runways and all utilized airfield and groundside surfaces is a process which ensures the maximum level of service and safety at TPIA.

The winter season at TPIA commences November 1 and continues through the end of April. During this period of time, GTAA Aviation Operations/Airfield Maintenance snow teams, snow removal contracted services, and others are available around the clock to ensure immediate readiness and response during all periods of inclement weather.

2.3 Basic Snow Event Operations
Although subsequent chapters address specific plans and processes for snow clearance, snow removal, and ice control operations as they pertain to different airport areas and groups, the basic snow event process generally consists of:

1. Pre-storm preparation and planning.
2. Initiating pre-planning calls between GTAA departments to determine operational readiness and coordinating operational strategies.
3. Conducting preliminary visual inspections on runways and apron surfaces to prepare for snow clearance and removal processes and ice control operations.
4. Clearing snow on various airport surfaces, according to a predetermined plan, made in advance of each storm, for both airfield and groundside areas.
5. Removing snow/cleaning up surfaces, including melting snow as it is being removed.
6. Following up with chemical application on all plowed surfaces, as required.
2.4 Terminology

Acronyms Used in This Document

The meanings of acronyms used in this document are shown in the following table.

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Meaning</th>
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<tbody>
<tr>
<td>ACC</td>
<td>Area Control Centre (NAV Canada)</td>
</tr>
<tr>
<td>AMFCC</td>
<td>Airfield Maintenance Facility Coordination Centre</td>
</tr>
<tr>
<td>AMSCR</td>
<td>Aircraft Movement Surface Condition Report</td>
</tr>
<tr>
<td>AMU</td>
<td>Apron Management Unit</td>
</tr>
<tr>
<td>AOC</td>
<td>Airport Operations Control</td>
</tr>
<tr>
<td>BMS</td>
<td>Building Management System</td>
</tr>
<tr>
<td>CDF</td>
<td>Central Deicing Facility</td>
</tr>
<tr>
<td>CRFI</td>
<td>Canadian Runway Friction Index</td>
</tr>
<tr>
<td>DMP</td>
<td>Departure Metering Program</td>
</tr>
<tr>
<td>ADM</td>
<td>Airport Duty Manager</td>
</tr>
<tr>
<td>MO AVS</td>
<td>Manager Operations, Aviation Services</td>
</tr>
<tr>
<td>RMU</td>
<td>Resource Management Unit</td>
</tr>
<tr>
<td>TPIA</td>
<td>Toronto Pearson International Airport</td>
</tr>
<tr>
<td>HDF</td>
<td>Hangar Deicing Facility</td>
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Basic Snow and Ice Event Terminology

Basic terms used throughout this document are indicated and defined in the following table.

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tr>
<td>Contaminated surface</td>
<td>The presence of any winter contaminant on a paved surface including snow, compact snow, slush, standing water, freezing rain, or ice.</td>
</tr>
<tr>
<td>Edge Light Cleaning</td>
<td>To ensure edge light systems are visible to pilots.</td>
</tr>
<tr>
<td>Ice control</td>
<td>Chemical application to a surface to melt any residual ice or snow. The applications used include potassium acetate, sodium formate, and sand (if and when authorized).</td>
</tr>
<tr>
<td>Icing event</td>
<td>The onset of snow activity and/or freezing rain combined with an expected drop in temperature that will cause ice to form on or bond with a paved surface.</td>
</tr>
<tr>
<td>Snow clearance</td>
<td>Plowing snow from a surface by pushing it to the side or edges of a surface.</td>
</tr>
<tr>
<td>Snow event</td>
<td>The onset of snow activity and the duration of time in which snow activity is occurring.</td>
</tr>
<tr>
<td>Snow event operations</td>
<td>Overall processes and functions involved in snow activities management including snow clearance, snow removal, ice control operations, and all associated tasks carried out during inclement weather.</td>
</tr>
<tr>
<td>Snow removal</td>
<td>Sweeping and cleaning surfaces after they have been cleared, including transporting snow accumulations to either a designated staging, piling, or melting area or off site location.</td>
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</table>

Terminology - Snow Types (on the ground)

The following table indicates the characteristics associated with different snow types that are used to plan snow clearance, snow removal, and ice control operations. This terminology is used throughout this document.
### Snow Types

<table>
<thead>
<tr>
<th>Snow Type</th>
<th>Definition/Characteristics</th>
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<tr>
<td>Compacted Snow</td>
<td>Snow that has been compressed into a solid mass that resists further compression and holds together or breaks into lumps if picked up. Specific gravity of 0.5 and over.</td>
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<tr>
<td>Contaminated Snow</td>
<td>Snow that is tainted due to the presence of glycol or other known contaminates which must be carefully isolated and treated. Also referred to as “pink snow”.</td>
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<tr>
<td>Dry Snow</td>
<td>Snow that can be blown if loose or, if compacted by hand, will fall apart again upon release. Specific gravity up to, but not including 0.35.</td>
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<tr>
<td>Slush</td>
<td>Saturated snow that, with a heel and toe slapdown motion, hits the ground with a splatter. Water will drain from slush when a handful is picked up. Specific gravity of 0.5 up to 0.8.</td>
</tr>
<tr>
<td>Wet Snow</td>
<td>Snow that, if compacted by hand, will stick together and form a snow ball. Specific gravity of 0.35 up to but not including 0.5.</td>
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</table>

### 2.5 Roles and Responsibilities

There are a number of committees, groups, offices, and personnel involved in snow clearance, snow removal, and ice control operations at TPIA. The following subsections provide information on the command centres, committees, and personnel involved in snow activities and their basic roles and responsibilities during a snow event.

#### Core Planning Group

In anticipation of, and during, a storm, members of the Core Planning Group collaboratively formulate a plan to carry out snow event operations at the airport. The Core Planning Group is exclusively responsible for initiating direct line planning calls during a storm in the event that ad hoc revisions or adjustments are required to the snow removal plan. The Core Planning Group includes:

- NAV Canada (including representatives from both the ACC and the Control Tower).
- Manager Operations – Aviation Services (AVS).
- Airport Duty Manager (ADM)
- The Airfield Maintenance Facility Coordination Centre Supervisor.

These offices initiate and discuss changes to the snow event plan, collectively develop a new plan, and communicate the changes to, and for implementation by, the snow teams carrying out snow event operations. The snow event plan may include information about the Departure Metering Program (DMP), available pads, crews, runway configuration, etc.

#### GTAA Snow Leadership

Personnel involved in leading snow-event operations are indicated in the following table, accompanied by their responsibilities as they relate specifically to snow event operations.

<table>
<thead>
<tr>
<th>Title</th>
<th>Duties</th>
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### Airfield Supervisor
Follows snow teams operating on the airfield in an inspection vehicle. Controls snow team operating on runways and taxiways; trails the snow removal crew when operating on the runway, and **MAY** provide Aircraft Movement Surface Condition Reports (AMSCRs).

### Airfield Technical Inspector
Inspects and reports on all surface conditions, before, during, and after snow event operations. Conducts Canadian Runway Friction Index (CRFI) reports; oversees snow event operations in their relevant areas, principally quality assurance and quality control, for snow activities carried out by contracted services.

### Manager Operations, Aviation Services
Provides global overview and leadership for ‘day of’ snow event operations. Hosts internal pre-planning calls as required.

### Airport Duty Manager (ADM)
Hosts external at-large briefings and internal pre-planning calls as required. The final authority in making ad hoc operational decisions in the event of any safety discrepancies between parties.

### Central Deicing Facility (CDF) Shift Manager
Responsible for maintaining safe surface conditions on taxiways and staging and deicing pads; oversees CDF operations.

### Apron Maintenance Supervisor
Controls snow team operating on GTAA-controlled apron surfaces.

### Functional Managers:
- Runways and Taxiways
- Apron and Groundside Maintenance
- Aviation Maintenance Programs
  - Investigate and resolve systemic issues with input from entire team
  - Formulate winter operational plan

## 2.6 Offices
The following table provides a brief description of the offices involved in snow-event operations at TPIA.

<table>
<thead>
<tr>
<th>Office</th>
<th>Description of responsibilities</th>
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<tr>
<td><strong>Air Carriers</strong></td>
<td>Provide, and confer with Core Planning Group on, expected traffic levels; control inbound and outbound flights as necessitated by weather; ensure, in advance of any snow activity, that all ground service equipment (GSE) and other obstacles are cleared or relocated in all pre-determined locations designated for snow piling or melting.</td>
</tr>
<tr>
<td><strong>Airport Operations Control (AOC) / Snow Desk</strong></td>
<td>Functions, as in daily operations, as the point of contact for all operational problems, delays, and/or disruptions. The AOC is also responsible for answering all calls to the Snow Desk line.</td>
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<tr>
<td><strong>Aeroplane Management Unit (AMU)</strong></td>
<td>Provides advisory services to aircraft on all GTAA-controlled aprons.</td>
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<tr>
<td><strong>Resource Management Unit (RMU)</strong></td>
<td>Provides gate planning services for all GTAA-controlled gates.</td>
</tr>
<tr>
<td><strong>Contracted Weather Service</strong></td>
<td>Provides weather forecasts and confers with GTAA command centres on an ongoing basis during snow activity.</td>
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<tr>
<td><strong>GTAA Airfield Maintenance Facility Coordination Centre (AMFCC)</strong></td>
<td>Coordinates snow event teams as they are performing snow event operations; receives and forwards reports on snow removal progress, airfield activities, CRFIs, and any other requests or information to the Snow Desk.</td>
</tr>
<tr>
<td><strong>NAV Canada</strong></td>
<td>Monitors and controls airport traffic on the manoeuvring area; provides priority clearance to snow teams clearing runways and taxiways; receives and forwards pilot reports (PIREPS); assists in opening/closing runways as required.</td>
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<tr>
<td><strong>CDF Icehouse</strong></td>
<td>Manage and facilitate the Central Deicing Facility (CDF) and associated deicing activities.</td>
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</table>
2.7 **Basic Office Interactions**

The following organizational chart details the basic flow of information.

![Core Planning Group Flow](image)

**Figure 1: Core Planning Group Flow**

2.8 **Areas of Responsibility**

**GTAA Areas**

The areas requiring snow clearance and removal are in excess of 5,900,000 square metres, the equivalent of four hundred kilometres of two-lane highway, and are categorized as either airside or groundsie areas which collectively include various parking lots, roads, sidewalks, aprons, runways and taxiways. The GTAA is responsible for snow event operations airport-wide.

The GTAA’s areas of responsibility in terms of snow clearance and snow removal processes and ice control operations are included in the following subsections.
Airside Areas
Runways, taxiways, airside roads and aprons are considered airside areas. The entire airfield area is the responsibility of the GTAA in terms of either performing or supervising snow event operations. FedEx apron gates 601, 603, 605, 607, 609, Air Canada Maintenance hangars, Skyservice apron and North General Aviation aprons are separately managed and maintained independently of the GTAA. Snow event operations on runways and taxiways are exclusively performed by GTAA Aviation Operations/Airfield Maintenance snow teams. Apron and CDF areas are serviced by GTAA Aviation Operations/Airfield Maintenance snow teams and are supported by the apron snow removal contracted services, whose operations are coordinated by the GTAA as they are being carried out. More specific information on these areas including the division of responsibilities for runways/taxiways and aprons is provided in Chapters 4 and 5, respectively.

Groundside Areas
Groundside areas include parking lots, roads, sidewalks and other public entrance and egress routes. Groundside areas are the responsibility of the GTAA with work being performed by groundside snow removal contracted services.
3 Snow Event Preparation and Planning

3.1 Scope
This chapter deals with all aspects of storm planning including coordinating resources and equipment, detailed office interactions and communications, conducting preliminary surface inspections, and formulating a snow event plan.

3.2 Overview
Proper storm planning and preparation in advance of snow or freezing rain accumulation is integral to ensure the least disruption and most functional operation of the airport as possible during a snow event.

The GTAA’s multi-agency and multi-disciplinary approach to snow event operations ensures that airport facilities are at their optimal efficiency on an hour by hour basis during all periods of snow activity. As with other major international airports, the GTAA recognizes that the airfield must be in a constant state of balance during all periods of snow activity. The elements that comprise this state of balance include the following:

- Offices sharing storm tactics and traffic estimates, principally the GTAA, and NAV Canada
- Airlines and handlers clearing their equipment from gate areas.
- All offices agreeing to limit activities when required.
- Following storm tactics and snow removal patterns and ensuring that estimates of occupancy times on various surfaces are accurate and based on snow composition and intensity.
- Timing and coordinating access to runway, associated taxiway systems, and aprons with the Core Planning Group (CPG) to maximize snow removal opportunities and minimize crew waiting times.
- Ensuring deicing activities are able to match launch capabilities.
- Matching arrivals and departures as closely as possible to prevent gridlock as a result of a lack of surfaces for aircraft staging.

As all of the aforementioned elements are components that comprise the airport as a total system, the state of balance must be maintained or it will negate any successful efforts to clear and remove snow. A lack of available gates, insufficient crews to move or service aircraft, or too many arrivals or departures can quickly shift the state of equilibrium leading to gridlock. Sharing unbiased analysis amongst all parties in an open and honest forum during and immediately after a storm is necessary to adjust tactical strategies on storm management for immediate implementation.
3.3 Snow Event Office Interactions
Before, during, and after a snow event, a series of office interactions occurs to prepare for, plan, and execute snow clearance, snow removal, and ice control operations. The offices involved, some of which also comprise the Core Planning Group, include:

- Manager Operation Aviation Services (MO AVS)
- Airport Duty Manager (ADM)
- Aviation Operations/Airfield Maintenance
- Weather Provider
- NAV Canada, both the ACC and Control Tower
- Apron Management Unit (AMU)
- Resource Management Unit (RMU)
- Central Deicing Facility (CDF)

The activities and interactions between these offices are indicated in the following subsections.

Activating GTAA Coordination Centres

The Snow Desk
The Snow Desk is located in the IOCC and functions during a snow event as:

- The coordination point for pre-storm conferences and continuous calls during all periods of snow activity.
- The contact centre for service requests from authorized personnel which are, in turn, relayed to Aviation Operations/Airfield Maintenance for action.
- Distributors of NOTAMs as required.

Airfield Maintenance Facility Coordination Centre (AMFCC)
The AMFCC functions as a focal point for communications between GTAA Aviation Operations/Airfield Maintenance teams and the IOCC Snow Desk. This coordination centre will also be augmented as required by an apron oversight function quartered in the AMU/RMU and additional oversight resources situated on the Apron.

Activating Other Offices and Agencies

Contracted Weather Services
Contracted Weather Services play a vital role in providing current forecasts and storm monitoring. They confer with representatives of the Core Planning Group in advance of, during, and after a storm occurs. These weather advisories are vital to all members of the Core Planning Group. They provide storm details which enable the GTAA to plan appropriate resources. Weather advisories are also used to analyze
and implement snow event operational tactics, assess areas of priority, and make changes as necessitated by weather conditions and storm activity.

**NAV Canada**
Personnel from NAV Canada are involved in pre-planning calls in advance of and throughout a storm.

**Resource Management Unit (RMU)**
The RMU is responsible for all gating. They will also assist the ALOs, Apron Maintenance, and air carrier/handler teams with short term gate closures to facilitate full gate cleaning operations between flights.

**Apron Management Unit (AMU)**
Consultations and interactions with GTAA Apron Management personnel are important to determine aircraft movement and towing activities and overall apron traffic levels. If and when significant interruptions in operations are expected and aircraft traffic levels and operations are affected, this office shall be notified. Conversely, if the AMU notices deteriorating conditions with respect to aircraft movement capabilities, the AOC will be notified.

**Air Carriers**
Carrying out successful snow event operations is contingent on the traffic levels projected by air carriers. Flight schedules and expected arrivals and departures will assist the GTAA in formulating an appropriate plan to focus snow event operations in accordance with priority areas of use. Discussions during the storm planning stages enable the GTAA and air carriers to develop snow removal tactics to minimize disruptions to operations and maintain the highest achievable level of service in advance of, during, and after the snow event.

Air carriers and their ground handlers are also responsible for removing their GSE, chocks, etc., from gates that are not currently being used by an aircraft.

### 3.4 Storm Planning Process

Upon being given notice of a forecast snow event, storm planning commences. The MO AVS begins hosting a series of tactical pre-planning calls with the intent of:

- communicating the forecast and determining the levels of service that can be realistically maintained
- making decisions on the timing of operations
- advising on strategies and tactics for snow clearance and removal

A subsequent at-large briefing will be held by the ADM advising the air carriers of these decisions and the operational plan.
Weather Briefings
NAV Canada daily calls to discuss traffic and weather take place at 0745 hours Toronto East, 1045 hours Toronto West. Calls also take place at 1500 and 1745 nationwide. All calls happen 365 days per year.

An additional external at-large briefing is held at 2000 hours, hosted by the ADM, and typically focuses on the next 24 hours’ weather forecast, CDF readiness, and Aviation Operations/Airfield Maintenance operational plans. During snow events the at-large briefing may also be used as an opportunity to schedule future briefings.

Planning and Progress Calls
In advance of any significant forecast event, the MO AVS initiates an internal pre-planning call among NAV Canada, AMFCC, AMU, RMU, CDF, and weather providers. Separate calls may be made in advance of the external at-large briefing to the major air carriers regarding traffic levels and any required reductions in traffic if levels are too high. The purpose of the pre-planning call is to develop the operational plan by determining operational readiness, communicate priorities, inform participants of the snow event plan, and discuss concerns among all involved participants.

During rapidly changing conditions, a pre-established hotline is utilized for up-to-the-minute communications between offices including the Snow Desk, the AMFCC, CDF, and NAV Canada Shift Personnel. As necessitated by conditions, the hotline is employed to make ad hoc changes to the previously agreed upon snow removal strategies, which are then distributed to the snow teams and offices for notification and/or action. Once the ad hoc plan is established, no office deviates from, or revises, the established plan or priorities without first consulting the other members of the Core Planning Group via hotline.

Formulating a Snow Event Plan
Since each snow event is unique, and different surfaces require different types of equipment and snow removal methods in accordance with the forecast event, plans will vary accordingly and any deviations from the plan, as may be necessary, are strictly reserved for the Core Planning Group. Generally, these plans are devised as guidelines, subject to change as necessitated by weather but structured for each group or area to consider the least amount of interference with operations and the least amount of occupancy time on any surface where snow event operations are being carried out.
Security

In order comply with the Aerodrome Security Measures, section 41 – Snow banks, Section 43 – Clear Zones, Aprons, and Section 44 – Clear Zones, Other Areas, it is important that snow blow operators understand that there needs to be a clearway of at least 1m from the fence inside the PSL (Primary Security Line), and 3m outside the PSL.
4 Snow Plan - Runways and Taxiways

4.1 Scope
This chapter covers snow event operations as they occur on runways and taxiways, the processes and tests used, protocols for opening and closing runways and taxiways when performing snow clearance, and the methods employed.

4.2 Overview
The snow removal methods employed by the GTAA ensure the least amount of disruption to the airport and the least amount of occupancy time on runway surfaces so that areas can be returned to service as quickly and as safely as possible.

4.3 Runway and Taxiway Surfaces
The five runways at TPIA include:

- 05-23
- 06L-24R
- 06R-24L
- 15L-33R
- 15R-33L

Taxiways, including all high-speed exits, are cleared in accordance with their associated runway(s). Decisions about which runways and associated taxiways to be plowed are determined by the priority of use and, once priorities are established, snow event operations on the airfield follow a standard, pre-determined plan.

4.4 Runway Condition Inspections and Reporting
As part of daily airport operations, year round, during normal weather conditions (for example, no precipitation), runway surfaces are inspected approximately every four hours. During the winter season, beginning in November through the end of April, runway surface inspections are the responsibility of the on duty qualified Aviation Operations/Airfield Maintenance personnel who shall conduct daily inspections at regular intervals throughout the day at 0200, 0600, 1000, 1400, 1730, and 2200 hours (local time), respectively. These inspections are visual only unless the surface is determined by the Runways and Taxiways Supervisor, Technical Inspectors, or staff trained in runway-condition reporting to be contaminated, meaning, visible surface conditions that may affect aircraft braking capabilities.

During severe storm conditions or rapidly changing weather conditions, inspections shall be conducted as necessitated by the rate of change in braking conditions, or as necessitated by the rate of change in weather. Other considerations in terms of increasing the frequency of inspections, in addition to weather, are PIREPS received.
from NAV Canada and any other requests for inspections that are forwarded to the Snow Desk. During severe storm conditions, NAV Canada extends priority to runway inspection vehicles allowing sufficient time for the person conducting the inspection, or test, to adequately assess the runway surface condition. Test results entered into the GTAA’s TRACR II system are immediately forwarded to NAV Canada, the AMFCC, and the AOC unit within the IOCC.

The GTAA will use the NAV Canada “SNOWiz” interface with TRACR II as its primary method of Surface Condition Reporting. In the event of a TRACR II or SNOWiz malfunction or failure, a contingency plan will be used to ensure the dissemination of the latest Runway Surface Condition Reports occurs.

Immediately after snow clearance and ice control on runway and taxiway surfaces is complete, a final CRFI test is conducted when conditions allow. The surfaces are inspected, and the runways are returned to NAV Canada to resume normal operations once the snow teams and inspection vehicles have safely retreated to a predetermined area or holding bay, out of the way of aircraft traffic.

### 4.5 Priority Levels

Priorities, in terms of areas where snow event operations will be focused, are assessed according to which runways are being, or will be, utilized. Although snow event operations will be carried out on multiple surfaces concurrently, as weather conditions allow, priority is given to the following areas if and when necessary, in order of importance:

**Priority 1 Areas**
- Arrival runways and associated high-speed taxiways.
- Departure runways.
- Taxiways connecting arrival runways to aprons.
- Taxiways connecting aprons to departure runways.
- Taxiways leading to and from the Central Deicing Facility.
- Visibility of lights installed as visual aids associated with the arrival and departure runways.
- Visibility and legibility of mandatory signs on taxiways associated with the arrival and departure runways.
- Access service roads from Fire Halls to runways, taxiways and Aprons.

**Priority 2 Areas**
- Secondary runways and associated high-speed taxiways.
- Taxiways to and from secondary runways.
• Visibility of lights installed as visual aids associated with the secondary runways and taxiways.
• Visibility and legibility of mandatory signs on these taxiways.

Priority 3 Areas
• Pre-threshold areas in accordance with Section 4.11 of AC 302-013 Issue 2.
• Runway and taxiway shoulder areas in accordance with Section 4.11 of AC 302-013 Issue 2.
• Other movement areas identified in this plan.
• Remaining airside signage and lights.

NAV Canada Navigation Aid Sites
At all times during a snow event, navigation aid sites are monitored by both NAV Canada and GTAA Aviation Operations/Airfield Maintenance snow teams to ensure that snow accumulation does not exceed forty centimetres (40 cm). Any snow accumulation exceeding this amount at any of these sites is likely to cause system or instrument failures for landing aircraft. If and when accumulations are nearing 40 cm, either Aviation Operations/Airfield Maintenance personnel or a representative from NAV Canada shall contact the Snow Desk to request snow clearance, priority being given to sites associated with the runways in use. A temporary runway shut down is required to clear the area which shall range in clearance time from forty-five minutes to one hour. The glide path sites are the highest priority.

Assuming accumulations do not exceed 40 cm during a storm, snow clearance and removal on all navigation aid sites shall take place immediately after a snow event, priority remains extended to the glide path sites.

Other navigation aid sites requiring snow clearance and removal include the following:
• Localizer associated with each of the ten runway ends.
• North Airport Surface Detection Equipment (NASDE) located on Britannia Road.
• South Airport Surface Detection Equipment (SASDE) located on Convair Drive.
• Transmitter site located on Courtney Park Drive.
• Back up transmitter site located at Britannia Road and Convair Drive.
• Receiver site.
• Terminal Surveillance Radar (TSR).
4.6 Opening and Closing Runways and Taxiways

The GTAA is proactive in determining whether or not it is safe for a runway or taxiway surface to remain open. Because surface areas are continuously monitored before, during, and after a storm, both aircraft traffic and operational safety are important considerations in determining whether or not a runway or taxiway surface should be closed. All airport leadership involved in snow event operations, are prepared to make the recommendation to close any or all surfaces before the situation becomes unsafe. The decision-making process begins using the following criteria in determining whether or not a runway or taxiway surface should be closed:

- Slush greater than 1/4 inch and covering the majority of the centre runway 80’.
- The CRFI reading is less than 0.2.
- PIREPS indicating nil braking capability.
- Snow depth equivalent to, or in excess of, two inches (2") of wet snow or six inches (6") of dry snow.
- The presence of windrows that are equivalent to, or in excess of, twelve inches (12").
- Difficulty controlling snow removal equipment.
- Reports of difficulty maneuvering aircraft.

Although the above criteria is used to assess safety risks and assist in making decisions about whether or not to close a surface, the above conditions do not mean that closure of the surface is automatic.

However, should the presence of any one or combination of the above criteria exist, the decision-making process is induced and, time permitting, consultation with the MO AVS occurs and the decision to close the surface is made.

Requesting and Issuing a Notice to Airmen (NOTAM)

Aviation Operations/Airfield Maintenance personnel shall notify the Snow Desk to report details of all surface conditions, including information collected in CRFI reports, which may warrant issuing a NOTAM. Criteria used to assess conditions that may warrant a NOTAM are published in the Canadian NOTAM Procedures Manual.

The decision as to whether or not to issue a NOTAM resides with the MO AVS based on observations and findings meeting the above criteria and surface conditions reported by Aviation Operations/Airfield Maintenance personnel.
While a NOTAM remains in effect, the on-duty Supervisor or Aviation Operations/Airfield Maintenance personnel shall forward status updates and complete runway surface condition reports as required in support of the issued NOTAM. These reports are forwarded or made available to NAV Canada.

Once a NOTAM is issued, it shall not be cancelled until runway conditions improve to the extent that surfaces are returned to a safe operational state. As NOTAMs of this nature will self-expire after 24 hours; they must be amended if the conditions are to remain beyond that period of time.

**Runway Occupancy Time**

It typically takes 15 minutes to clear a runway of snow. The exception is runway 05-23, which typically takes 20 minutes. For all runways, a midpoint reference must be established to ensure that the runway team can clear it in the allotted time.

If for any reason runway teams become aware of imminent delays related to the return of surfaces, the supervisor in charge will advise Nav Canada and the AMFCC as soon as possible.

**4.7 Team Briefings**

Prior to commencing snow event operations, the Airfield Maintenance Supervisor conducts a briefing with awaiting snow teams to review protocols, procedures, priority areas, snow activity and other pertinent information related to the snow event. A sample agenda may include the following:

- Weather briefing: relay anticipated storm duration and anticipated accumulation to crews.
- Priority review: runways and associated taxiway systems taking precedence during the upcoming storm and planned sequence of clearance and cleaning operations.
- Responsibilities: remind lead plow operator of radio duties and obligations as the exclusive contact with Control Tower personnel.
- Radio protocol reminder: maintain radio silence on assigned event channel.
- Priorities, recite plan, follow radio protocols, and responsibilities for the day.
- Identified hazards and mitigation including team safety.

**Communication Protocols**
Communicating with the Control Tower

It is the responsibility of the Lead Plow Operator exclusively to contact the Control Tower to arrange for clearance for the plow crew prior to proceeding onto an active runway to commence snow event operations.

Once the crew approaches the hold line, it shall be up to the Lead Plow Operator to make contact with the Control Tower and clearance shall be directed to the Lead Plow Operator. The Supervisor retains overall control to ensure that all radio communications occur as required.

4.8 Plow Formation Techniques

There are two plowing formations for the runway snow crew:

1) The “V” plowing formation, applicable to runways only.

2) The “one way” plowing formation, applicable to both runways and taxiways.

Determining which of the two techniques to employ depends on a number of factors such as wind direction and wind conditions, storm severity, weight and density of snow, the distance to be covered, and clearance time allotted. The decision about which of the two formations to implement shall be made by the Airfield Supervisor after evaluating these factors and any other considerations.

4.9 Runway/Taxiway Snow Removal Plan

All runways and taxiways shall be plowed and swept. All manoeuvring area surfaces may then be treated with a chemical application, either potassium acetate, sodium formate, or sand as conditions dictate.

4.10 Dedicated Runway Crews and Equipment

One pass is required to open the runway to the minimum clearing width of 160 feet (49 metres) which is possible utilizing the following dedicated crews working in unison:

- One runway crew consisting of up to eight (8) high-speed plow/sweeper/blower unit operators and up to three high-speed snow blower operators.

- One or two high-speed taxiway crews consisting of up to four plow/sweeper operators accompanied by one or more snow blower operator(s).

- Roving taxiway crews, consisting of three snow removal equipment operators and a snow blower operator.

Once the runway crew commences snow clearing operations on a priority runway, the high-speed taxiway crews begin plowing and sweeping the high-speed taxiways associated with that runway.
Concurrently, the roving taxiway crews cover apron entrances and the remaining taxiways not covered by the high-speed taxiway crews. The roving taxiway crews will also maintain a clear path from IFT entrance FA to EY.

Organized planning and synchronized efforts between all three dedicated crews result in an average clearing time of fifteen (15) minutes for a runway surface and associated high-speed taxiways.

4.11 Minimum Runway Clearing Width

It is the objective of the GTAA to clear the full 200 feet (60 metres) of runway width, of snow, slush, and ice. However, under certain severe storm conditions, it may not be viable to achieve this, given fixed site resources. If and when the GTAA is forced to reduce the clearing width under the full 200 feet, every effort is made to ensure and maintain a minimum clearing width of 160 feet (49 metres). Should weather necessitate a reduction in clearing width, the depth of any remaining snow shall not exceed twelve inches (30 centimetres) in any plowed location between the cleared portion of the runway and the runway edges.

Windrows will not remain in any unclear areas. Whatever the actual runway width cleared and/or treated, will be included on the Aircraft Movement Surface Condition Report (AMSCR) completed by the Inspector and published on NOTAM J via SNOWiz.

4.12 24R Holding Bay West Taxilane and Hotel 6

During snow events, Aviation Operations/Airfield Maintenance will NOTAM close Hotel 6 during active snow removal and the 24R Holding bay West Taxi Lane during the 06L operations.

4.13 Airside Ice Control - Runways and Taxiways

When an icing event is forecast, potassium acetate is used on runway and taxiway surfaces in advance of freezing precipitation to prevent compacted snow from bonding to the surface. Sodium formate is used when ice or compacted snow is already present on the surface. The decision to use airside chemicals is made only after taking weather considerations into account. For example, chemicals will not be applied if high winds are forecast and/or temperatures are anticipated to be significantly below minus ten degrees Celsius. When ice control chemicals alone are not sufficient, sand is used, only as and when authorized, to increase the coefficient of friction on slippery surfaces. Application of sand on runways is carefully considered prior to use and then authorized as necessary by the Supervisor of Runways and Taxiways or the Technical Inspector.

4.14 Snow Cleanup

Snow cleanup includes:
• opening all manoeuvring area surfaces to full width and length
• cleaning all visual aids including lights, signs, and edge markers
• cleaning all navigational aid sites
• eliminating all winter-surface contamination from manoeuvring surfaces
• removing snow/ice from all airfield-access roads.

Snow-cleanup will restore the airfield to full operation. Surface-closure times are dependent on winter contamination.

Note: Snow cleanup activities performed between the hours of 00:30 and 06:00 do not adhere to the runway occupancy time commitments as cleanup efforts are more time consuming.
5 Snow Plan - Aprons

5.1 Scope
This chapter addresses the apron snow removal surfaces at TPIA and the areas of responsibility as they are divided between GTAA Apron Maintenance snow teams and tenants.

This chapter also provides information on:
- apron surfaces
- snow plowing plans
- inspection and reporting processes
- ice control operations specific to apron surfaces.

5.2 Overview
All aprons must be safe and cleared according to priority of use.

Aircraft taxi stand lanes and terminal gates must be kept clear and operational while snow event operations are carried out with special attention and priority given to walk-on gates and availability of international gates as required. GTAA snow teams and tenants perform snow event operations on multiple apron surfaces simultaneously.

Prior to the arrival of a storm, Apron Maintenance is responsible for the following:
- Coordinating and establishing snow staging areas.
- Organizing and setting up crews and equipment.
- Notifying all snow removal contracted services that a storm is approaching and for them to prepare personnel and equipment and proceed to their appropriate areas of responsibility.
- Inspecting the aprons, in coordination with the ALOs, to watch for chocks, ground power cables, and other ground service equipment (GSE) obstructions or objects that can cause damage to, or have damage caused by, snow removal equipment.

All apron snow-event operations are performed by GTAA Apron Maintenance and supported by contracted services. GTAA Apron Maintenance Specialists, Apron Maintenance Supervisors and Technical Inspectors oversee the entire operation.

Note: Airlines and agents are not authorized to clear snow from gate areas or any apron area without prior written approval from the GTAA.
5.3 **Apron Surfaces**

Apron surfaces can be divided into four (4) areas:

- Infield aprons (including FedEx)
- Hangar Deicing Facility (HDF)
- Central Deicing Facility (CDF)
- Terminal aprons.

In all areas, all components of all apron surfaces are the responsibility of GTAA Apron Maintenance snow teams supported by contracted services on an “as required” basis.

**Infield Aprons**

Infield apron surfaces include:

- Infield Cargo
- Infield Terminal (IFT)
- 3-Bay Hangar
- FedEx

**Central Deicing Facility (CDF)**

Apron surfaces include these Pads: 1, 2, 3, 4, 5, 6, and Taxilane 1.

**Terminal Aprons**

Terminal apron surfaces include:

- Terminal 1
- Terminal 3

The division of responsibilities between the GTAA and tenants is provided in the following section.
5.4 **Apron Snow Removal Responsibilities**

**GTAA Areas**

GTAA Apron Maintenance snow teams are responsible for the following components of all apron surfaces in terms of snow event operations:

- Snow clearance and removal on the entire apron surface.
- Clearing and removing snow on all lead-in lines for all gates at all terminals.
- Clearing and removing snow from apron walk-on gates.
- Clearing and removing snow on all vehicle corridors on the apron.
- Clearing and removing snow from all bussing access routes on the apron that may be utilized to transport passengers to and from terminal buildings.
- Ice control operations on all apron surfaces.

**Tenant Areas**

Snow clearance and removal on all apron surfaces, with the exception of the apron components covered by the GTAA Apron Maintenance snow teams, are the responsibility of the tenants.

<table>
<thead>
<tr>
<th>Apron Area</th>
<th>Services Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>North General Aviation</td>
<td>Snow clearance, snow removal, and ice control operations</td>
</tr>
<tr>
<td>Air Canada Maintenance Aprons</td>
<td></td>
</tr>
<tr>
<td>Vista Cargo Aprons</td>
<td></td>
</tr>
<tr>
<td>Skyservice Apron</td>
<td></td>
</tr>
<tr>
<td>FedEx Gates 601, 603, 605, 607, 609</td>
<td></td>
</tr>
</tbody>
</table>

5.5 **Apron Inspections**

**Pre-Storm Apron Inspections**

A pre-storm apron inspection is carried out by Apron Maintenance personnel and Aviation Liaison Officers to ensure that any GSE, such as baggage carts and wheel chocks, are removed in advance of snow event operations.

**Monitoring Apron Conditions and Reporting**

Apron Maintenance personnel also conduct inspections of all apron surface conditions during and after a snow event. Areas that pose an immediate operational impact are immediately reported to the Snow Desk for notification and to the AMU and given the highest priority. All other conditions that require action, not of an
immediate nature, are reported to the AMFCC for dissemination to all appropriate parties, including the Snow Desk, as necessary.

Apron Maintenance personnel shall endeavor to provide:

- Ongoing verbal reports via radio to the AMFCC.
- An Apron Condition Report once daily and additional condition reports as required during significant change.

**Requesting a Voice Notice to Airmen (VN)**

Requesting a VN is necessary if and when unplanned, potentially urgent events occur that may require apron surface closures, or emergency repairs on any surfaces utilized by aircraft during a snow event. The on duty Apron Maintenance Supervisor or Technical Inspector shall verbally notify the Apron Management Unit (AMU) – followed by the Snow Desk or the AOC, via telephone to request an immediate VN should any ad hoc/urgent apron closures be required due to a surface situation that may be dangerous to aircraft or aircraft traffic.

This may include, for example, unexpected snow-pile accumulations on the apron during snow removal, which will require immediate removal, or, taxilane restrictions due to snow event operations.

As standard practice prior to a snow event, the AMFCC shall contact the Snow Desk to advise of any apron aircraft taxilane restrictions. Information regarding the estimated times that restrictions will commence shall be provided to the Snow Desk in addition to an estimated time that the restrictions may be lifted. Any variances or deviations from planned apron restrictions, or estimated time frames as provided by the AMFCC shall be updated to the Snow Desk with a request for VN as required or as necessitated by weather conditions. The AOC exclusively shall coordinate and disseminate all VNs to all offices and agencies requiring notification.

### 5.6 Snow Clearance Strategy

The overall Apron snow clearance strategy will attempt to minimize the handling of snow. The primary methodology will be ‘load and go’ operations coordinated with the taxilane clearance activities. Gate clearing will push to the neutral side of the gate where snow will be loaded and moved to other locations. Load and Go operations will be also be conducted at the Apron edges.

### 5.7 Center Line Clearing

At the beginning of every snow event, the first response is the removal of accumulated snow off all center lines in both terminals to allow for optimum visibility by airline crews. Snow removal will commence in these areas: lanes 1 and 2,
3 and 4, 5 and 6, 7 and 8, 9 and 10, and 11. The operators work in a continuous pattern covering all lanes and crossovers as required throughout the event.

### 5.8 Priority Levels

**Priority 1 Areas**
- Passenger walk-ons and gate lead-in line clearing for Terminal 1 and 3.
- Aircraft stand taxilanes for Terminal 1 and 3.
- Central Deicing Facility.
- Terminal aircraft stands (focus on availability of international gates (as required) and those areas that will be in use first).
- Head of Stand and Tail of Stand vehicle corridors.
- Visibility of lights installed as visual aids.

**Priority 2 Areas**
- Visibility of signs installed as visual aids.
- Infield Cargo apron.
- Three Bay Hangar apron.
- FedEx apron.

**Priority 3 Areas**
- Apron shoulders.
- Apron entrance JE.
- Remaining Infield Terminal apron.

### 5.9 Manual Snow Removal

Within the scope of responsibilities for apron snow removal there are a number of other priorities that are not accessible by larger snow-clearing equipment.Assigned to the apron areas are hand-crews equipped with small equipment that manually clear, remove the snow, and apply deicing chemicals, as required.

These areas include:
- Bus stop sidewalks and entrances
- Roll-up doors leading into baggage areas
- Employee entrances and emergency exits
- Accumulated snow around bridgehead wheels.
5.10 Gate Clearing and Sweeping
During the event there are a number of loaders with snow buckets assigned to gates both open and occupied to push accumulated snow into piles for removal to the designated snow-dump site. The loaders work systematically through the gates with priorities being international gates (as required), those gates that are unoccupied, or upon receiving instructions from the Apron Maintenance Supervisor or Technical Inspector as to which gate should be cleared next. When the gates have been cleared of snow, designated pieces of equipment will clear any remaining accumulation prior to deicing applications, if required. Coordination is required with the ALO and the ACA Performance Manager for T1.

5.11 Apron/Gate Chemical Applications
During an event, there are designated pieces of equipment that are capable of applying dry chemical as a deicer. This equipment moves in a systematic pattern following behind plowing and sweeping operations and/or responding to requests from the AMFCC regarding areas that require treatment.

5.12 Glycol Contamination (airport wide)
During snow events there may be a requirement for an aircraft to return to a gate after it has been deiced. In the event that an aircraft does dock at a gate and contaminates the surrounding snow, follow the Return to Gate policy.

5.13 Command and Control
For the purposes of safety and to minimize the impact to apron operations during an event one important aspect of the operation is command and control. During an event, there are both contracted services and in-house resources working together in the snow removal process. To ensure that both resources are working as a cohesive unit, Apron Maintenance Supervisors and Technical Inspectors oversee the snow-removal process.

Apron Maintenance Supervisor
The Apron Maintenance Supervisor oversees the operation of in-house resources. It is their responsibility to ensure that the snow plan is followed as closely as possible and to make decisions on any operational adjustments that may be required before, during the event and for post event cleanups.

Technical Inspector
The Technical Inspector is responsible for the quality control of the contracted snow removal services. The Technical Inspector is to ensure, through direct communication with the contract supervisor, that all the snow removal resources (loaders, etc.) assigned to a designated area are performing as per the Snow and Ice Control Plan of
Operations and to report any issues that may arise during the event. They are also responsible for inspections and apron-surface condition reporting, as required throughout the event.

5.14 **Airside Ice Control - Aprons**

Airside ice control and all chemical applications on apron surfaces are strictly reserved for the GTAA. Sodium formate is used when ice or compacted snow is already present on the apron surface. The decision to use airside chemicals is made only after taking weather considerations into account. For example, some chemicals will not be applied if high winds are forecast and/or temperatures are anticipated to plunge below minus ten degrees Celsius.

When ice control chemicals alone are not sufficient sand may be used, only as and when authorized, to increase the coefficient of friction on slippery surfaces. Application of sand is carefully considered prior to use and then authorized as necessary by the on duty Apron Maintenance Supervisor or Technical Inspector.

Sandboxes are located at each terminal building gate and routinely inspected by Apron Maintenance to ensure that an adequate supply of sand is available at all times. Contracted services and tenants are encouraged to apply sand on slippery surfaces, such as bridge stairs and walk-on gates, only as and when necessary.

During snow events, tenants are encouraged to forward questions to the Snow Desk at (416) 776-3153.
Figure 3: Snow Clearing Surfaces: Terminal Area, Infield, and FedEx Aprons
Figure 4: Snow Clearing-Apron Zone 1 Terminal 1 (part 1 of 2)
Figure 5: Snow Clearing-Apron Zone 1 T1 (part 2 of 2)
5.15 Infield Cargo, Infield Terminal, 3-Bay Hangar and FedEx Snow Plans

The following subsection outlines the snow plans for the Infield Cargo, Infield Terminal, Three-Bay Hangar and FedEx aprons.

Infield Cargo

Prior to commencing snow event operations and as required, Apron Maintenance contacts the AMFCC to have Gates 509 and 508 cleared of aircraft and GSE and closed to accommodate a temporary snow pile. The AMFCC relays all information to the Snow Desk and notifies the AMU/RMU of the gate closures. Upon completion of snow removal operations and after the storm has subsided, the same process of calls and notifications occur advising that work is complete and the apron gates are open for operation.
Snow is plowed starting closest to the terminal building and continuing in a pattern around the IFT gates until the snow has been pushed to the outside edges of the apron. Once the snow has been pushed to the apron edges it will be pushed or blown into the ditch lines adjacent to the apron edges. Access will be maintained between EY and FA.

Gates 530 and 531 may be closed to facilitate snow dumping and melting operations.

Upon completion of all snow removal operations, snow may be melted in this area and gates 530 and 531 may be returned to operation.
Prior to commencing snow event operations, Apron Maintenance contacts the AMFCC to have gates 541, 542, and 543 cleared of aircraft and GSE and closed to accommodate a temporary snow pile.

The AMFCC relays all information to the Snow Desk and notifies the AMU/RMU of the hardstand parking location closures. Upon completion of snow removal operations and after the storm has subsided, the same process of calls and notifications occur advising that work is complete and the apron gates are open for operation.
FedEx

Snow is plowed from the west to the east edge of the apron and blown into ditches with a two-stage runway blower as required.

During snow events greater than 3 cm, Apron Maintenance may contact the AMFCC to have apron entrance JE closed via NOTAM. Further, Apron Maintenance personnel ask the AMFCC to contact the RMU advising of any additional hardstand closure requirements.

Upon completion of snow removal operations and after the storm has subsided, Apron Maintenance contact AMFCC to have apron entrance JE opened.
5.16 Central Deicing Facility (CDF) Snow Plan

The Technical Inspector will provide oversight of the apron snow-event operations and will coordinate snow-removal efforts with the contracted snow removal service provider as required. When conditions and operations dictate, the CDF operator will also provision a Snow Removal Coordinator to facilitate and prioritize snow removal operations.

CDF Surfaces

These are the surfaces that the GTAA supported by contracted snow removal service provider is responsible for in terms of snow clearance, snow removal, and ice control operations. These surfaces include the CDF taxiway system, deicing pads, the contaminated snow area, diversion vaults and fill stations, and the airside CDF parking areas and walkways.

CDF Taxiway System

The CDF taxiway system includes:

- CDF taxilane 1.
• Taxiway Victor.
• Taxiway Tango.

Deicing Pads

Deicing pads, six in total, include both staging bays and deicing bays. Clearing and removing snow from lead in lines and corridors for accessibility to these areas is also vital.

Contaminated Snow Area

The contaminated snow area, situated by the Ice House in the north observation area, shall be utilized for piling and dumping glycol contaminated snow that is removed from the aircraft deicing pads. All snow that is removed from CDF surfaces shall be piled and melted in the contaminated snow area.

Priority Levels

Snow-event operations will be carried out on multiple surfaces concurrently, where priority is given to the following areas, if and when necessary, in order of importance:

1) CDF taxilane 1.
2) Taxiway Victor.
3) Taxiway Tango.
4) Deicing pads and associated vehicle safe zones including lead in lines in priority sequence.
5) Sidewalks at entrances.
6) Airside parking area.
7) Contaminated snow area.
8) Vehicle corridors.

Other areas also referred to herein as peripheral areas, that are considered priorities but not easily accessible and will be cleared manually during all snow activity include:

• Pad filling stations
• Fresh glycol tank farm area
• Diversion vaults and hatchways
• Valve gallery islands
• Signs and light standards.
Every attempt shall be made to clear all areas simultaneously. However, maintaining safe surface conditions in all areas is contingent on the severity of snowfall. During heavier than normal periods of snow activity, fixed resources, in terms of equipment and personnel may not be sufficient or capable of covering all areas concurrently.

Whenever priorities shift as a result of weather conditions, the Duty Maintenance Manager or the MO AVS, shall implement the priority levels for snow clearance, snow removal, and ice control operations, in order, as indicated.

Figure 11: Snow Clearing-Apron Zone 3 Central Deicing Facility (CDF)

Push and Pile Method

This method on CDF surfaces requires snow to be pushed into piles into “safe zones,” meaning, snow is pushed in between the staging bays of a deicing pad which are areas that are not utilized by aircraft or vehicular traffic, where it is later removed. The safe zones can store the snow removed from the staging portion of the pads as well as the snow cleared from all entrances to the pads from taxiway Echo. This method shall be considered a contingency method, employed only if, for any reason, high-speed equipment is unserviceable or if heavy snow accumulation dictates. This method can also be utilized if necessary on:

- CDF taxilane 1.
• Taxiway Tango (CDF taxilane to taxiway Mike).
• Taxiway Victor (CDF taxilane to taxiway Mike).

The safe zones are indicated in the CDF drawing in this chapter.

**Half-Pad Method**

This method is employed when there is heavy aircraft traffic. Half the pad (for example, usually the north or south) is closed for snow clearance while the other remains in operation. Often in the method two adjacent half pads will be closed at the same time to facilitate clearing of the pads and the parking areas in between them. For instance, 6S would be closed in conjunction with 5N, or 4N with 5S, etc.

**Closing Deicing Pads**

If and when closing deicing pads, either partially or entirely, becomes necessary to carry out snow event operations, the Lead Plow Operator, in coordination with the CDF Ice House, shall notify the Snow Desk as to what areas are closed and what areas remain operational. As the Snow Desk is in constant communication with multiple offices, agencies, and teams throughout a snow event, the Snow Desk is able to advise any parties affected by these closures. Upon completion of snow event operations and once the pads are re-opened, the Lead Plow Operator, with the CDF Ice House, shall again contact the Snow Desk and Apron Technical Inspector to advise that the deicing pads are open for operation.

**Taxiway Echo between Echo Alpha and Delta**

During snow event operations this area will be cleared by the Airfield Roving Taxiway Team.

**Deicing Pads - Deicing Bays**

The majority of the deicing bays shall be kept clear of snow because of sprayed glycol in the area. Areas adjacent to safe zones shall be cleared during half-pad cleanups and full closures. The push and pile method that is utilized to remove snow from the main CDF taxilane also removes a large portion of snow from the deicing bay and the exits.

**Vehicle Corridor**

The vehicle corridor on the west side of the taxilane shall be kept clear of snow at all times. The taxilane crossings at Stop 1 and 3 shall be kept clean by use of a plow pushing snow westward from the taxiway shoulder to the roadway.
Peripheral Areas

Peripheral areas are considered priorities but are not easily accessible and require manual clearance by labourers. The following areas shall be barrier free or surface safe and otherwise tended to as required by the on shift labourers:

- Sidewalks.
- Elevated edge lights.
- Fill station islands on the pads and taxiways.
- Diversion vault lids and waste glycol system hatchway lids (these areas in particular must be kept clear and exposed to prevent damage from snow plows).
- Area directly in front of the garage (this area must be kept constantly clean and barrier free to enable the safe movement of deicing and snow removal vehicles requiring repair).

Airside Ice Control - CDF Apron Area

When an icing event is forecast, anti-icing material may be applied on apron surfaces in advance of the frozen precipitation to prevent ice from bonding to the apron surface as weather conditions allow. Under normal snow event weather conditions, the GTAA snow team shall pre-treat the CDF apron at the same time as other apron surfaces are being treated.
HDF Snow Removal

Standby
During active precipitation, the apron entrances, Pad taxilane and the taxilanes from AE and AF to the WEST edge of the Air Canada Hangar 11 will be maintained by the Runways and Taxiways Roving Taxiway team. After precipitation has ceased, the remainder of the surfaces WEST of Hangar 11 will be cleared.

Active Deicing
An initial snow removal pass will be facilitated by the GTAA Airfield Maintenance ‘Roving’ team within approximately 30 minutes upon request with ongoing clearance throughout the event maintained by GTAA Apron Snow Removal and Support Services contracted service providers on surfaces WEST of Hangar 11.

Figure 12: Snow Clearing-Apron Hanger Deicing Facility (HDF)
6 Snow Plan - Groundside

6.1 Scope
This chapter deals with the groundside infrastructure that requires snow clearance, removal and ice control operations during the winter months.

6.2 Overview
All groundside roadways, bridges, parking structures, parking lots and sidewalks are the responsibility of the GTAA with the exception of those areas under Tenant Land Leases. Where possible, multiple groundside surfaces are cleared of snow simultaneously. However, essential access and egress routes to passenger terminals and other operational facilities are considered the highest priority and take precedence over all other surfaces, in the event that establishing a priority order is necessitated by extreme weather conditions.

All snow removal operations for the groundside road and bridge infrastructure is performed by a contracted service provider. The Groundside Technical Inspector oversees and audits the Contractors’ snow-event performance during snow-removal operations. The Manager of Groundside Maintenance is responsible for the overall management of the contract.

6.3 Groundside Surfaces

Groundside Roadways and Bridges
The groundside road and bridge infrastructure consists of approximately 91 lane kilometers of which 11 are bridge surfaces. The entire infrastructure is broken down into five (5) distinct routes. Each route has its own designated snow-removal resources (equipment, labour, etc), which are dependent on the Snow Event classification callout.

In order to mitigate the potential for sodium chloride products (salt or salt brine) from being tracked onto the aircraft movement area of the airport, application of these products will not be applied within 100 meters of vehicle airside access gates. Consequently, sand will be applied as required to improve friction in these areas. Note that this 100 meter restriction applies to the following vehicle access points - V302, V315C, V332, V409 and V328.
Groundside Parking Lots

The Groundside parking lots are approximately 432,276 square metres in total area. All of the parking areas are under the two (2) snow removal contract agreements, supervised by the Technical Inspector staff.

Groundside Sidewalks

The groundside-sidewalk infrastructure is approximately 19,864 square metres in total area. The Manager, Custodial Services is responsible for the contract for sidewalk snow-removal.

All other sidewalk snow-removal requirements fall under the same two contract agreements for the groundside road/bridge infrastructure and Parking Lots 6A and 6B. Both are supervised by the Technical Inspectors.

Any sidewalk connected to a building with cleaning staff is overseen by the Manager, Custodial Services.

Equipment Callouts

The equipment used by the contracted services in any given event during the winter season is called out prior to the commencement of the event.

The quantity of labour and equipment will vary according to the forecast briefing session that occurs on a scheduled basis throughout the winter season.
Figure 13: Area 6A & 6B
Figure 14: Paving: Route No. 1 – Red Zone
Figure 15: Paving: Route No. 2 – Blue Zone
Figure 16: Route No. 3 – Green Zone (1 of 2)
Figure 17: Route No. 3 – Green Zone (2 of 2)
Figure 18: Route No. 4 – Purple Zone
Figure 19: Route No. 5 – Brown Zone
Appendix A: Winter Operations Resources

7.1 Scope
This appendix describes the personnel, shift coverage and mobile winter equipment available during winter operations at the GTAA.

7.2 Resources

Personnel

The following table indicates GTAA personnel resources and shift levels on standby during the winter season, from the beginning of November through to the middle of April.

<table>
<thead>
<tr>
<th>Role</th>
<th>Number of Staff in the Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associate Director, Airfield Operations</td>
<td>1</td>
</tr>
<tr>
<td>Manager, Runways and Taxiways</td>
<td>2</td>
</tr>
<tr>
<td>Manager, Apron Maintenance</td>
<td>1</td>
</tr>
<tr>
<td>Manager, Groundside Maintenance</td>
<td>1</td>
</tr>
<tr>
<td>MO AVS</td>
<td>5</td>
</tr>
<tr>
<td>ADM</td>
<td>5</td>
</tr>
<tr>
<td>Manager, Airside Electrical</td>
<td>1</td>
</tr>
<tr>
<td>Manager, Fleet Services</td>
<td>1</td>
</tr>
<tr>
<td>Airfield Operations Supervisors</td>
<td>8</td>
</tr>
<tr>
<td>Airside Electrical Supervisors</td>
<td>2</td>
</tr>
<tr>
<td>Airfield Operations Technical Inspectors</td>
<td>8 Total: 3 full time and 5 seasonal</td>
</tr>
<tr>
<td>Airport Surface Maintenance Specialists</td>
<td>139 Total: 70 full time and 69 seasonal</td>
</tr>
<tr>
<td>Fleet Maintenance Supervisors</td>
<td>3</td>
</tr>
<tr>
<td>Fleet Mechanics</td>
<td>18</td>
</tr>
<tr>
<td>Welders</td>
<td>2</td>
</tr>
<tr>
<td>Airside Electricians</td>
<td>18</td>
</tr>
<tr>
<td>Airside Electrical Construction Project Coordinator</td>
<td>2</td>
</tr>
<tr>
<td>Facility Maintainers</td>
<td>6</td>
</tr>
</tbody>
</table>
Standby Shift Coverage and Availability

All crews are on scheduled standby as required from the middle of November through the middle of April, providing constant availability on all areas should a snow event occur.

7.3 Training

Training required to support this Snow and Ice Plan of Operations for Airfield Maintenance includes:

- Recurring annual refresher training of the Snow Removal Tactics Plan
- Training or refresher training of necessary snow removal heavy equipment, confirmation of valid certification such as AVOP and PDL
- Training or refresher training of surface condition inspection and reporting