



Preseason Snow Meeting

30 October 2024

King County International Airport Operations

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KCIA Airport Duty Manager

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KCIA Airport OPS Specialist

Overview

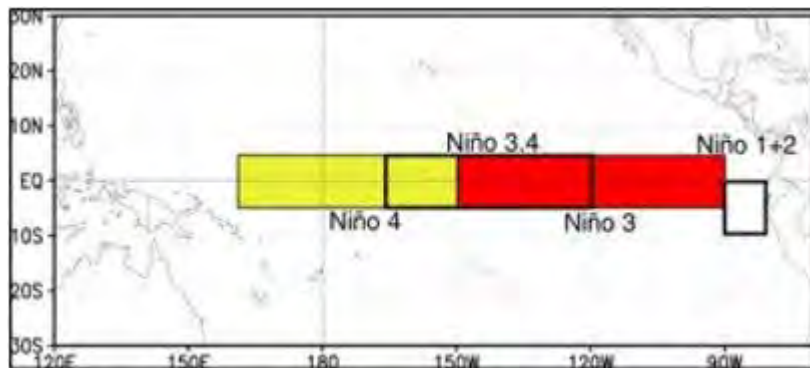
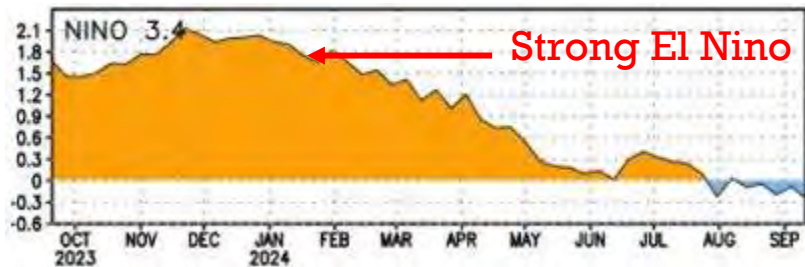
- **2024 – 2025 Winter Outlook**
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2024 – 2025 Winter Outlook



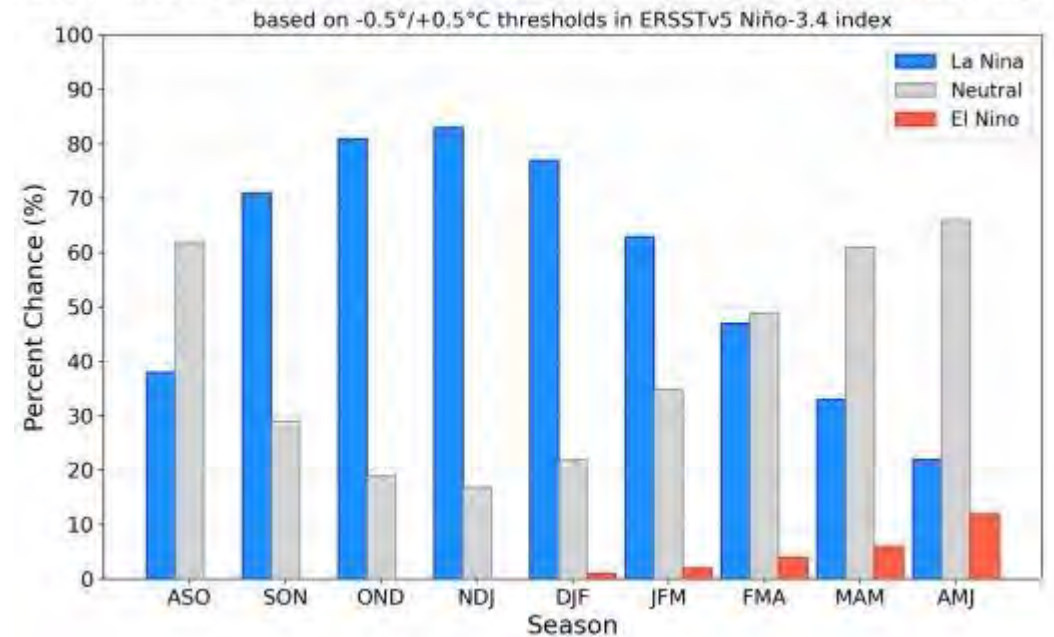
Around a 70 percent chance for La Nina conditions to emerge in the equatorial Pacific in September-November

Nino 3.4 Region SST Observations

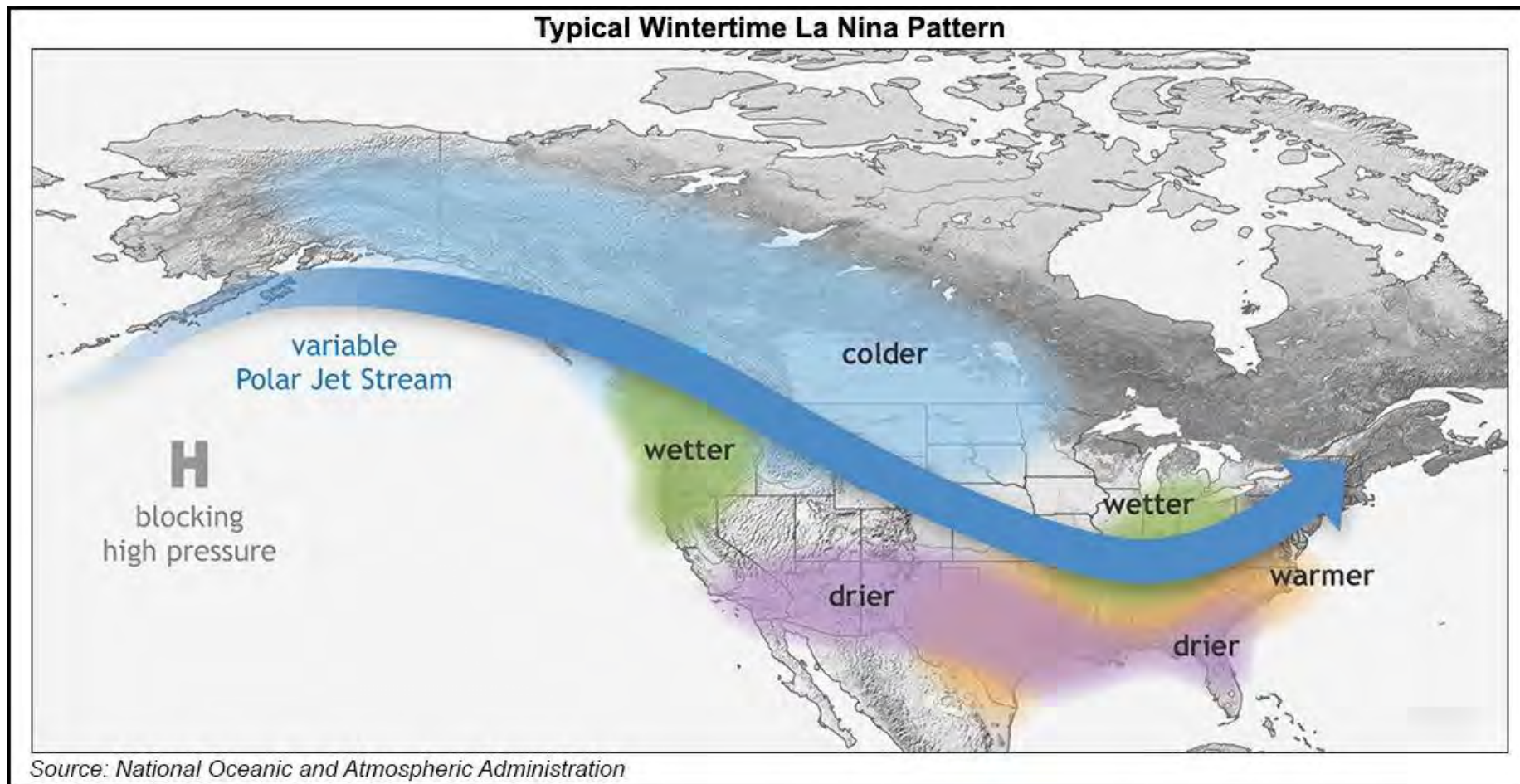


Probabilities for ENSO Conditions

Official NOAA CPC ENSO Probabilities (issued September 2024)



LA NINA Pattern



Weather Highlights

La Nina Watch – La Nina conditions are favored to develop this fall (70% chance) and persist into the winter season (80% chance).

Temperature and Precipitation Outlook:

Temperatures = Below normal favored (Moderate Confidence)

Precipitation = Above normal amounts favored (Moderate to High Confidence)

Snow Prediction:

Snow Forecast = **ABOVE** average snowfall favored

Pre-Season Actions

- Airport management Meetings
 - *Start in October*
 - *Readiness, materials, repairs, staffing, budget, training....*
- Personnel Training
- Equipment Preparation
- Snow and Ice Control Committee (SICC)

Pre-Season Actions

- Airport management Meetings
 - *October*
- Personnel Training
 - *Operations, Maintenance, Administration, ARFF*
 - *OPS: VERICOM/CFME, LOA, NOTAM/FICONS, RCAM, SICP*
 - *AFM: Equipment, movement, SICP*
 - *Admin: As needed, SICP*
- Equipment Preparation
- Snow and Ice Control Committee (SICC)



Pre-Season Actions

- Airport management Meetings
 - *October*
- Personnel Training
- Equipment Preparation
 - Operations, Maintenance, FBO's...
 - *OPS: Equipment calibration*
 - *AFM: Equipment maint. & supplies*
 - *FBO: Adequate deicing fluid, landside preparedness/contracts*
 - *FAA Approved only for airside; SAE AMS 1431/Solid, SAE AMS 1435/Fluid*
- Snow and Ice Control Committee (SICC)



Pre-Season Actions

- Airport management Meetings
 - October
- Personnel Training
- Equipment Preparation
- Snow and Ice Control Committee (SICC)
 - Feedback/Recommendations prior to Winter
 - *Chaired by ADM, Airport MGMT, Airport MX, Engineering, FAA*

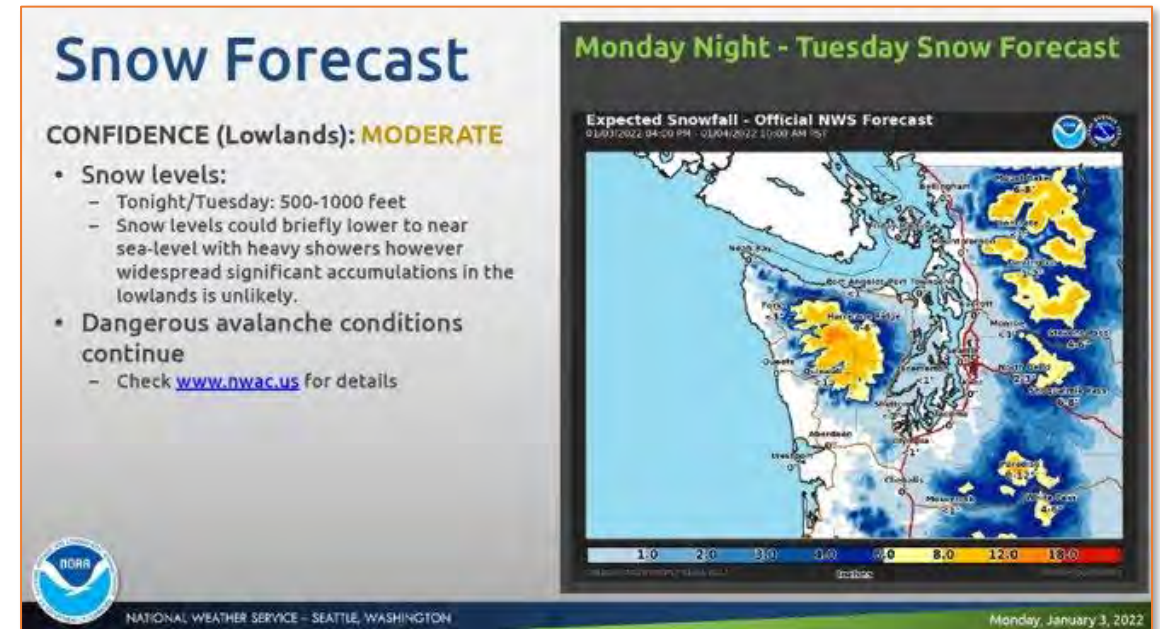


Snow Removal Action Criteria

- Activating Snow Removal Personnel
 - *NWS warning*
 - *Airport enters emergency stage*
 - *Staffing is designated/called out*
 - *Safety briefing*
- Weather Forecasting
- Chain of Command
- Triggers for Initiating Snow Removal
- Personnel Responsible
- Snow Control Center
- Airfield Clearing Priorities
- Airfield Clearing Times



Examples



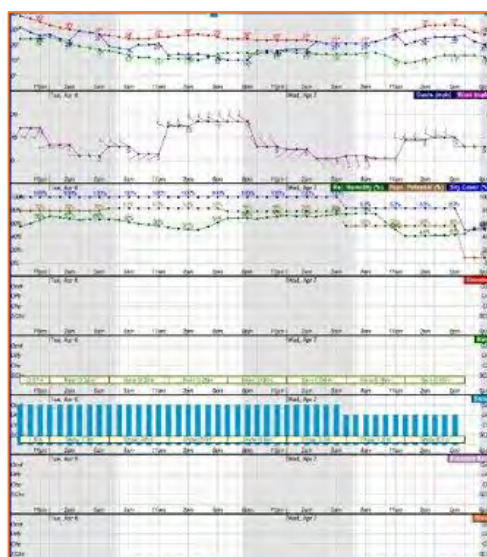
Snow Removal Action Criteria

- Activating Snow Removal Personnel
- Weather Forecasting by NOAA
 - *NWS is an agency of NOAA*
 - *24 Hour office in King County/Live briefings*

TAF



Hourly Forecast Breakdown



National Weather Service
National Oceanic and Atmospheric Administration

Weather Forecast Office
Seattle, WA
Saturday, Dec 4, 2021

Mountain Snow and Potential for Mixed Wintry Lowland Precipitation

Next Update: 7:00 AM Sunday, December 5, 2021

KEY POINTS

- A cooler weather pattern will remain in place for the next 7 days with lower snow levels.
- Weather systems are expected to move through the area today and Sunday night into Monday.
- Potential for at least a lowland rain/snow mix exists, especially with the Sunday night-Monday weather system.
- Mountain snow with accumulating snow for the Passes through the next week.

WEATHER RISK OUTLOOK

Risk levels incorporate potential impacts from weather hazards and likelihood of occurrence.

Sat 12/4	Sun 12/5	Mon 12/6	Tue 12/7	Wed 12/8	Thu 12/9	Fri 12/10
Mountain and Possible Lowland Snow Minor Coastal Flooding	Mountain and Possible Lowland Snow Minor Coastal Flooding	Mountain and Possible Lowland Snow Breezy Minor Coastal Flooding	Little to None	Mountain Snow	Mountain Snow	Little to None
Risk Levels		Little to None	Minor	Moderate	Major	Extreme

Examples

Snow Removal Action Criteria

- Activating Snow Removal Personnel
- Weather Forecasting
- Chain of Command
 - *Airport Duty Manager and/or Airport Maintenance Supervisor, Operations Manager, Deputy & Airport Director*
- Triggers for Initiating Snow Removal
- Personnel Responsible
 - *ADM Activate SICP and notify Leadership, MX*
 - *ADM Coordinates w/ATCT for friction testing*
 - *ADM Coordinate staffing for Snow Control Center*
 - *MX Sup coordinate equipment and supply inventory*
 - *Leadership ensure compliance and adherence of established procedures*

Snow Removal Action Criteria

- Activating Snow Removal Personnel
- Weather Forecasting
- Chain of Command
- Triggers for Initiating Snow Removal
 - *Commence at 1/8th snow accumulation*
 - *Immediately for Ice/FZ rain*
 - *Beforehand for anticipated event*
- Personnel Responsible
- Snow Control Center
- Airfield Clearing Priorities
- Airfield Clearing Times



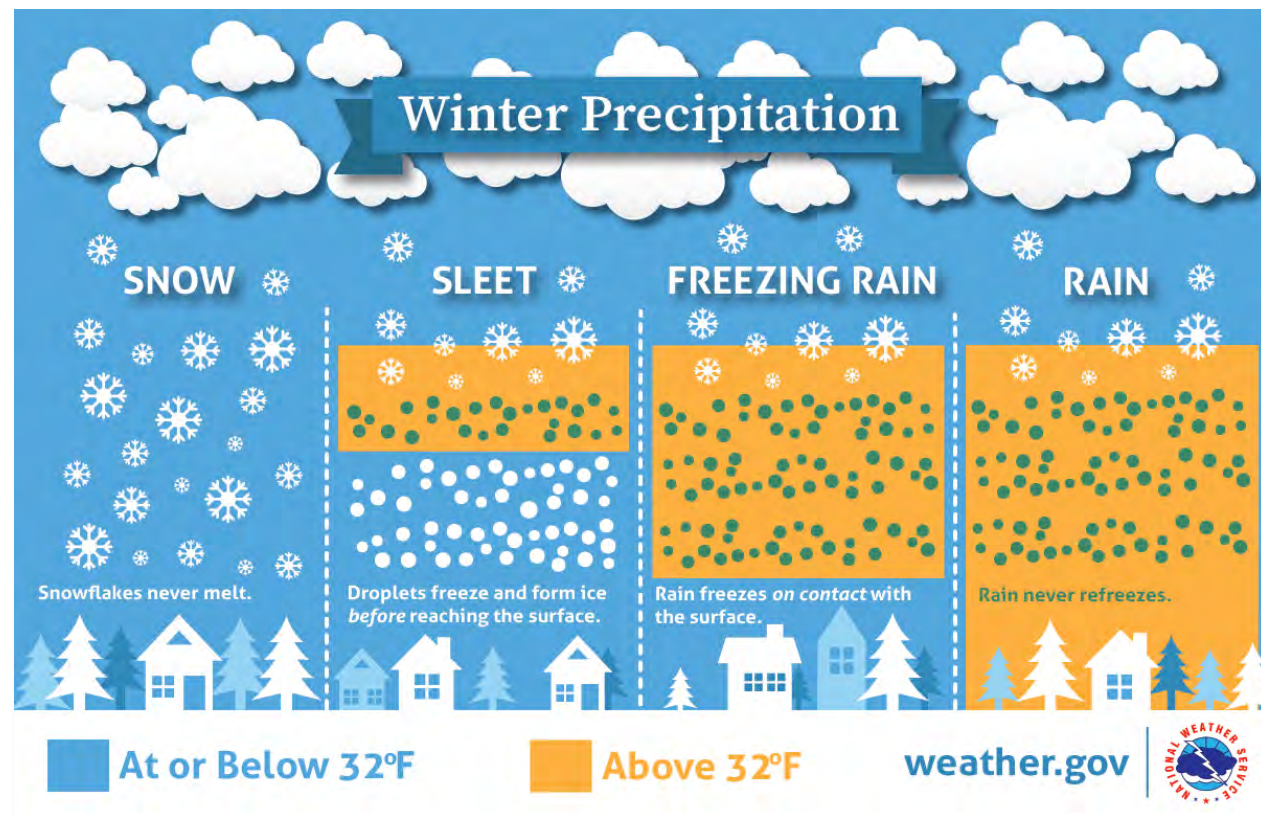
Snow Removal Action Criteria

Slush- Partially melted snow/ice. Water will drain when picked-up

Wet Snow- Well compacted snowball can be made. No water when squeezed.

Dry Snow- Snow will not stick together.

Ice/FZ rain- Ice, previously a liquid solidified by falling surface or air temps. FZ RA- a liquid, freezing upon making contact with surface.



Snow Removal Action Criteria

- Activating Snow Removal Personnel
- Weather Forecasting
- Chain of Command
- Triggers for Initiating Snow Removal
- Personnel Responsible
- Snow Control Center
 - AKA Snow Desk
 - *Normally a secondary ADM or airfield specialist or airport staff*
 - *Gather's all information. Makes notifications. Communication link between all users/staff.*
 - *Coordinates with ATCT during adverse weather conditions requiring runway closures*
- Airfield Clearing Priorities
- Airfield Clearing Times



BFI Airport Operations Center

Snow Removal Action Criteria

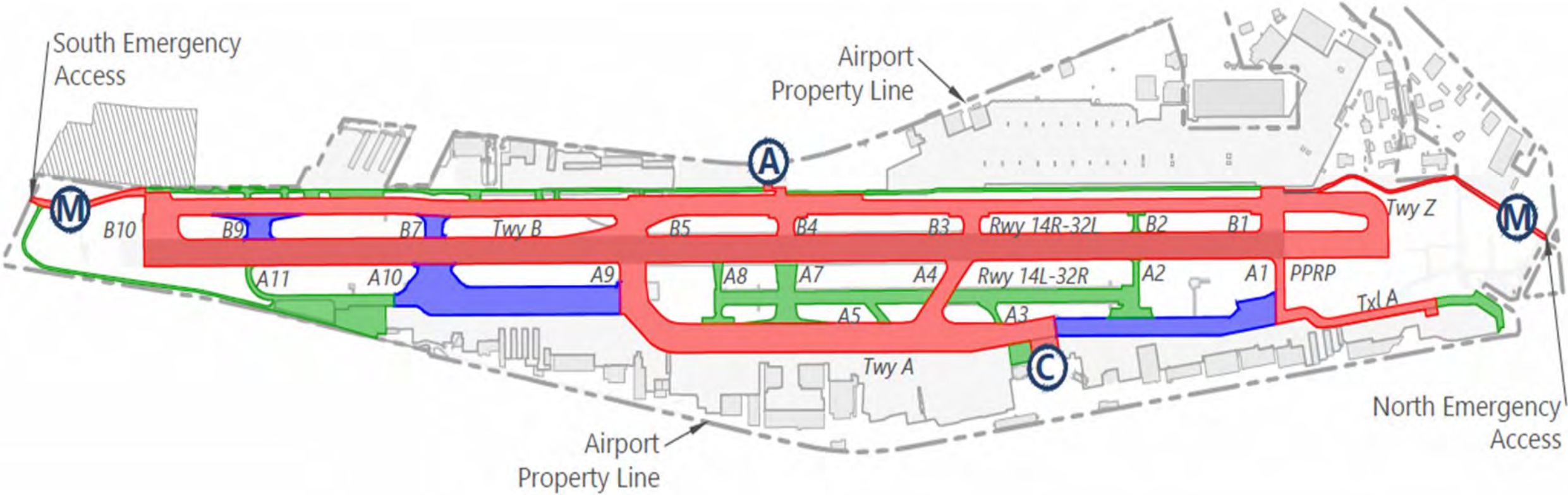
- Activating Snow Removal Personnel
- Weather Forecasting
- Chain of Command
- Triggers for Initiating Snow Removal
- Personnel Responsible
- Snow Control Center
- **Airfield Clearing Priorities**
 - Priority 1, 2, 3
 - Priority 1 most critical
- Airfield Clearing Times



Airfield Clearing Priorities

Priority 1-RED, Priority -2 BLUE, Priority -3 GREEN

M = Mutual Aid, A = ARFF, C = Terminal



Snow Removal Action Criteria

- Activating Snow Removal Personnel
- Weather Forecasting
- Chain of Command
- Triggers for Initiating Snow Removal
- Personnel Responsible
- Snow Control Center
- Airfield Clearing Priorities
- Airfield Clearing Times
 - *Per FAA AC 150-5200-30 = 30 min for Priority 1*

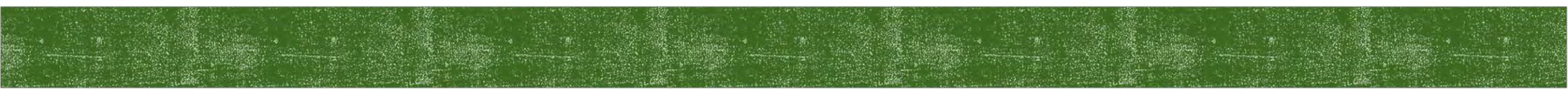
Table 1-1. Clearance Times for Commercial Service Airports

<i>Annual Airplane Operations (includes cargo operations)</i>	<i>Clearance Time¹ (hour)</i>
<i>40,000 or more</i>	<i>½</i>
<i>10,000 – but less than 40,000</i>	<i>1</i>
<i>6,000 – but less than 10,000</i>	<i>1½</i>
<i>Less than 6,000</i>	<i>2</i>

General: Commercial Service Airport means a public-use airport that the U.S. Secretary of Transportation determines has at least 2,500 passenger boardings each year and that receives scheduled passenger airplane service [reference Title 49 United States Code, Section 47102(7)].

Footnote 1: These airports should have sufficient equipment to clear 1 inch (2.54 cm) of falling snow weighing up to 25 lb/ft³ (400 kg/m³) from Priority 1 areas within the recommended clearance times.

BFI Operations 2023 = 157,064



Snow Equipment



MTE



Broom



Liquid Deice



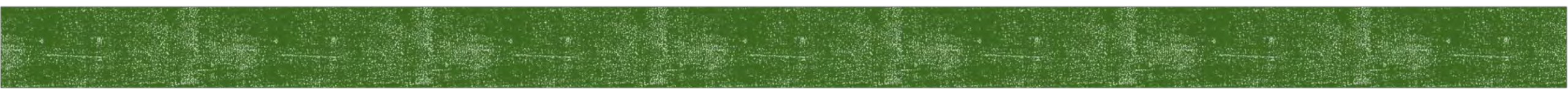
Blower



Plow



CFME



Snow Clearing and Ice Prevention - Ramps

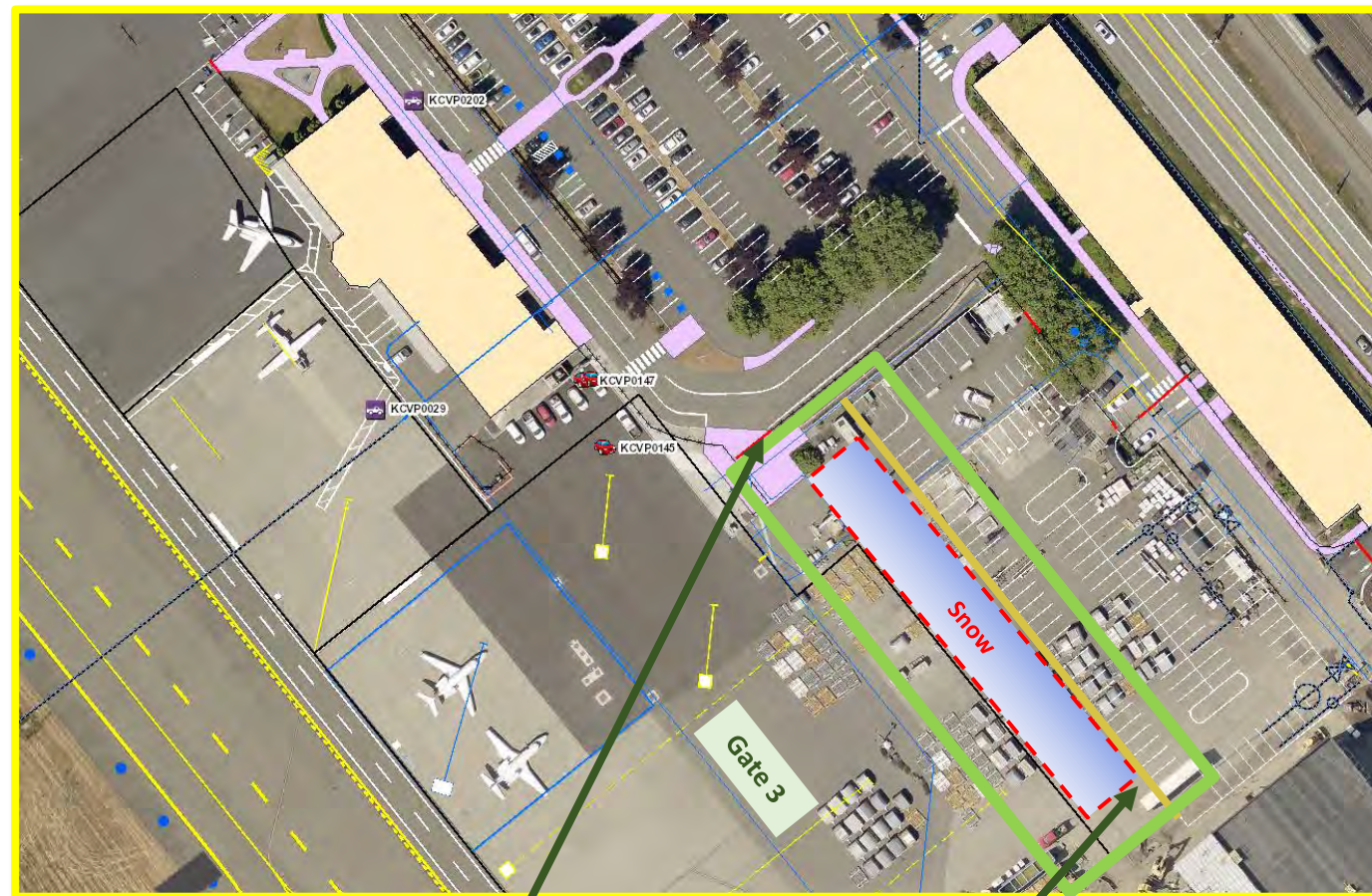
- Airport Ops will coordinate with main terminal tenants
- All other tenants are responsible for removing snow and/or ice from their leased (airside/landside) space and notify airport operations of their plans
- Assistance is available with notification and when resources become available
 - *Coordination must be made in advance during route clearing*



Snow Disposal Locations

Main Terminal

- South-East end near vehicle gate along UPS temporary fence line



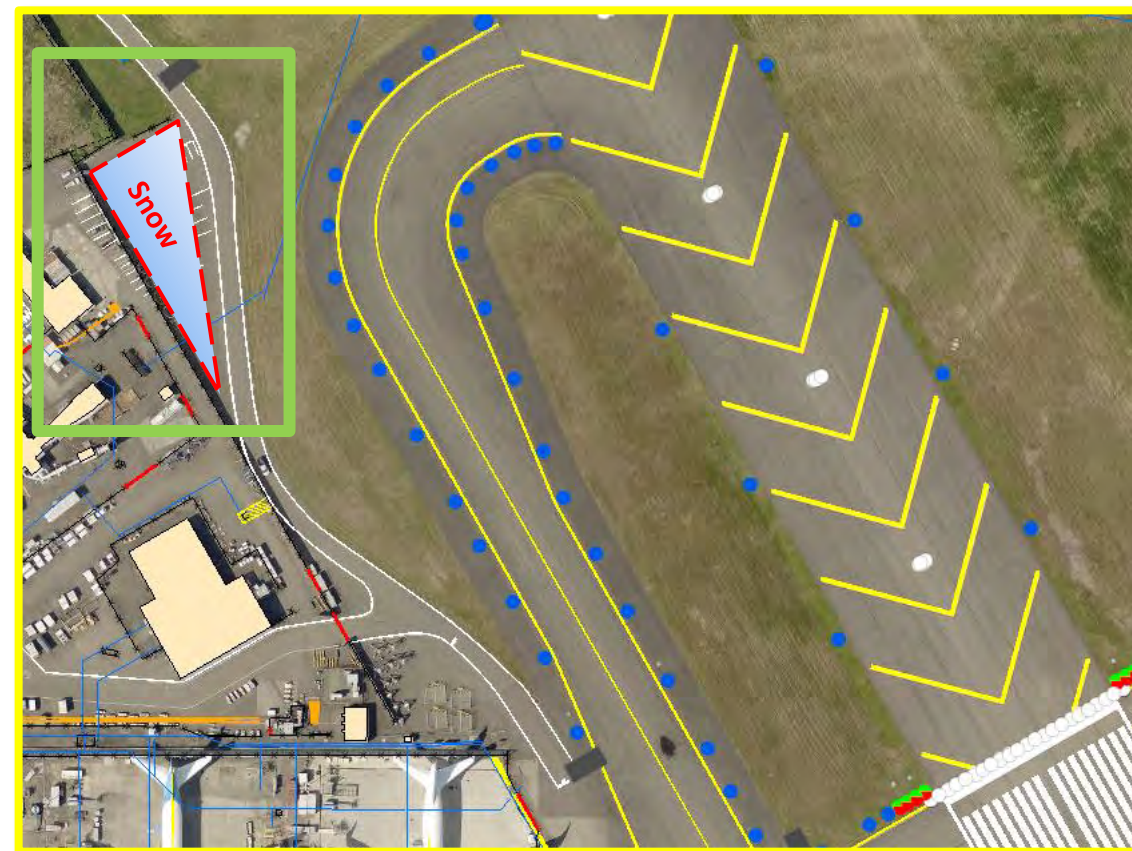
County Vehicle Gate V-17

UPS Temporary Parking Lot Fence

Snow Disposal Locations

Airfield

- *North of B1 along Boeing Blast fence*
- *North or South Airfield*
 - *Outside of OFA's*



Service Road Restriction

Vehicle service road North of B1

- *Hot Spots*
- *Limited Space for Snow Equipment transit*
- *Only route for snow equipment*
- *Boeing equipment awareness*



Continuous Surveillance

Continuous surveillance inspections conducted when contaminate begins to accumulate on movement surfaces

- *Braking PIREPs, Temps, WX patterns, Friction tests, Self-Inspections...*
- *Operations/Maintenance assess situation to determine steps for treatment*

- 14R-32L will be cleared 10,000 X 200' or 150'
- Operations will report conditions throughout the event to include:
 - *Pavement contaminants, snowbanks, windrows, deicer type*
 - *Reports will be updated as conditions change, following each deicing/ anti-icing events, contaminant type*
- Removal efforts will continue until pavement areas, runway signs, edge lights and markings are clear of contaminates

Methods for Surface Ice Control and Removal - Chemicals

- FAA Approved Liquid and Solid De-Icers on Airside only
 - *Liquid: Potassium Acetate*
 - *Solid: Sodium Formate*
- Applied Before precipitation, during or after mechanical removal.
- Tenants; use **FAA approved** chemicals on **airside ramps only**
 - *FAA approved chemicals follow SAE standards*
- **Salt approved for Landside only**



NAAC



E36

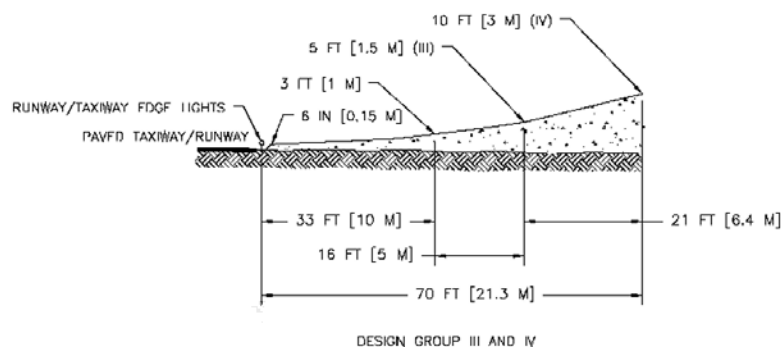
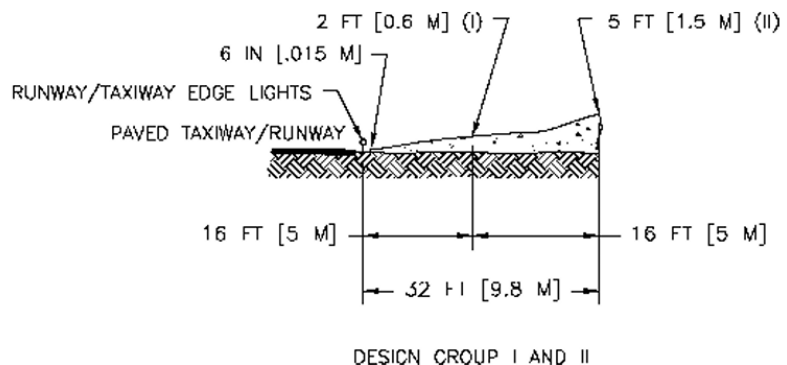


Snow Clearing and Ice Prevention – Snowbanks/ Drifts

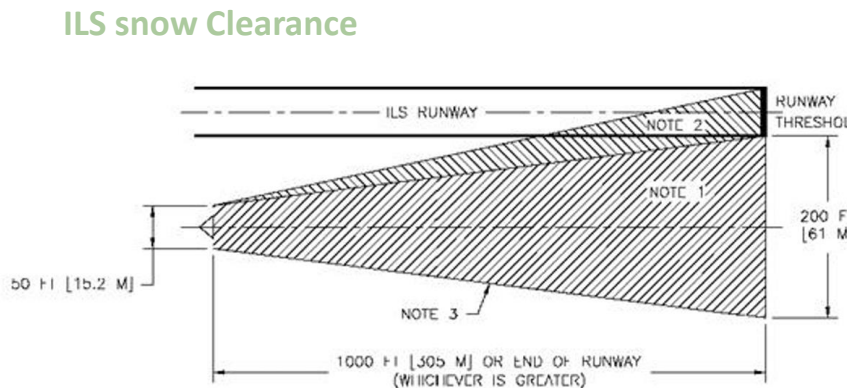
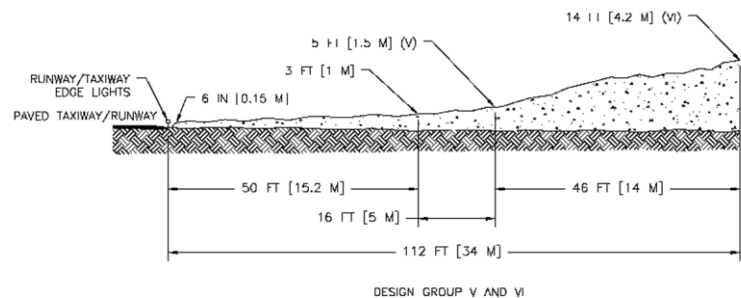
- Reported and mitigated as soon as possible
- Those that can't be moved will be kept in accordance with FAA Figure 4-1 and users will be notified by NOTAMs
- Snow Drifts are removed promptly
- Snow Disposal
- NAVAIDS
 - *Visual obscured*
 - *Electronic signal loss/scattering*



Snowbanks/ Drifts FAA Requirements



Snowbanks on Runways



NOTES:

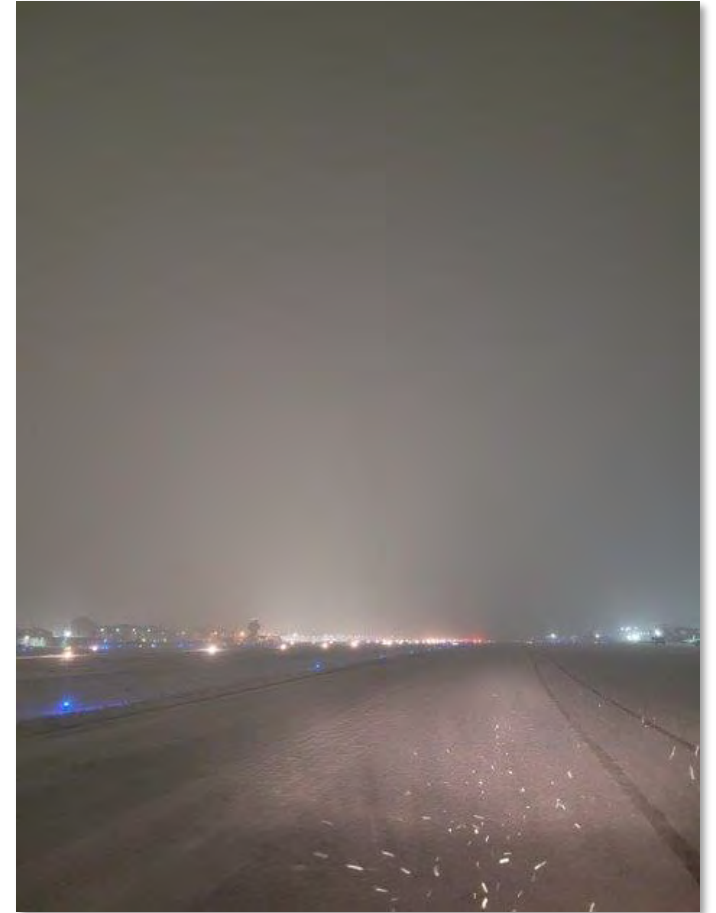
- CATEGORY I GLIDE SLOPE SNOW CLEARANCE AREA.
- CATEGORY II AND III GLIDE SLOPE SNOW CLEARANCE AREA. THE AREA DEPICTED UNDER NOTE 1 SHALL ALSO BE CLEARED.
- THE DEPTH OF SNOWBANKS ALONG THE EDGES OF THE CLEARED AREA SHALL BE LESS THAN 2 FEET.

ACTION TAKEN	SNOW DEPTH		
	SBR <6 IN [15 cm] NR. CECS <18 IN [45 cm]	SBR 6 TO 8 IN [15 TO 20 cm] NR. CECS 18 TO 24 IN [45 TO 60 cm]	SBR >8 IN [20 cm] NR. CECS >24 IN [60 cm]
SNOW REMOVAL (SEE ABOVE FIGURE)	REMOVAL NOT REQUIRED RESTORE FULL SERVICE AND CATEGORY.	ILS CATEGORY I REMOVE SNOW 50 FT [15M] WIDE AT MAST WIDENING TO 200 FT [60M] WIDE AT 1000 FT [300M] OR END OF RUNWAY TOWARD MIDDLE MARKER. ILS CATEGORIES II AND III AS ABOVE PLUS WIDEN THE AREA TO INCLUDE A LINE FROM THE MAST TO THE FAR EDGE OF RUNWAY THRESHOLD.	
NO SNOW REMOVAL	RESTORE FULL SERVICE AND CATEGORY.	ALL CATEGORIES	ALL CATEGORIES
		RESTORE TO CATEGORY I SERVICE. CATEGORY D AIRCRAFT MINIMA RAISED TO LOCALIZER ONLY.	APPROACH RESTRICTED TO LOCALIZER ONLY MINIMA.
		TYPICAL NOTAM TEXT: "DUE TO SNOW ON THE IXXX (APPROPRIATE IDENTIFIER) GLIDE SLOPE, MINIMA TEMPORARILY RAISED TO LOCALIZER ONLY FOR CATEGORY D AIRCRAFT" IF APPLICABLE, "CATEGORY II NA" OR "CATEGORY II/III NA".	TYPICAL NOTAM TEXT: "DUE TO SNOW ON THE IXXX (APPROPRIATE IDENTIFIER) GLIDE SLOPE, MINIMA TEMPORARILY RAISED TO LOCALIZER ONLY."

* NA (NOT AUTHORIZED)

Surface Incident/ Runway Incursion Mitigation Procedures

- All personnel required to complete airport driver training
 - *Reviewed pre-season*
- Tabletop exercise conducted prior to snow season to simulate procedures/practices
- All vehicles equipped with an airfield map
- Vehicles marked/lighted in accordance with AC150-2510-5
- Airport Operations and/or Maintenance coordinate with ATCT
 - *All vehicles will ensure functional VHF radios*
- Failed Radio Communication Training
- Low Visibility and Whiteout Conditions
 - *Extreme Caution/ Suspend*
- Driver Fatigue
 - *2X 12 hour shifts*



NOTAMS/FICONS

NOTAM. Notice to Air Missions (previously notice to airmen)

- Issued to broadcast the status of a surface such as CLOSED, RESTRICTION, UNSAFE, NON-STANDARD, WORK IN PROGRESS ETC.
- **BFI 01/001 BFI RWY 14R/32L CLOSED 2209011400-2209011500**
 - Long term for utility runway (14L-32R)/Priority 2/3 surfaces
 - Short term for main runway (14R-32L)

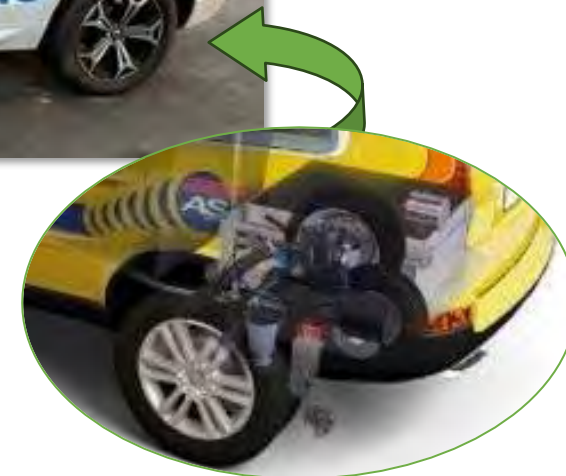
FICON. Field Condition

- Issued to report surface contaminants on runways, taxiways, and apron/ramps
 - **BFI 01/002 BFI RWY 14R FICON 5/5/5 100 PCT 1/8IN DRY SN OBS AT 2209011500-2209021500**
 - **BFI 01/003 BFI RWY 14R FICON 5/5/5 100 PCT 1/8IN DRY SNOW DEICED SOLID 2209011500-22090121500**
 - Only runway FICONS have RCCs (runway condition codes) but require < 25% SFC contaminant
 - Can be read in reverse for opposite direction approaches
 - Closed surfaces do not have FICONS.
-
- NOTAMs can be grouped ie **TWY A2, A3, A5 CLSD**
 - NOTAMS/FICONS issued in Zulu Time. Seattle is currently 7 hours behind Zulu ie 1400Z = 0700am Local
 - We strive to maintain 'no worse than wet' condition

Surface Assessment and Reporting Conducting Surface Assessments

Volvo xc60 ASTF CFME

- Full length of runway
 - Direction of Landing runway
 - Speed up to 40 MPH
 - 10' from the centerline
- Only valid under the following conditions;
- Runway contaminated more than 25% Ice or wet ice at any depth
 - Compacted snow at any depth
 - Dry snow less than 1 inch
 - Wet snow or slush 1/8th inch or less



Surface Assessment and Reporting Runway Condition Assessment Matrix (RCAM)

Table 5-2. Runway Condition Assessment Matrix (RCAM) (for Airport Operator Use Only)

Assessment Criteria		Downgrade Assessment Criteria		
Runway Condition Description	Code	Mu (μ) ¹	Vehicle Deceleration or Directional Control Observation	Pilot Reported Braking Action
<ul style="list-style-type: none"> Dry 	6	40 or Higher	—	—
<ul style="list-style-type: none"> Frost Wet (Includes Damp and 1/8 inch depth or less of water) 	5		Braking deceleration is normal for the wheel braking effort applied AND directional control is normal.	Good
1/8 inch (3mm) depth or less of: <ul style="list-style-type: none"> Slush Dry Snow Wet Snow 	4	30 to 39	Braking deceleration OR directional control is between Good and Medium.	Good to Medium
5° F (-15°C) and Colder outside air temperature: <ul style="list-style-type: none"> Compacted Snow 	3		Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.	Medium
<ul style="list-style-type: none"> Slippery When Wet (wet runway) Dry Snow or Wet Snow (Any depth) over Compacted Snow 	2	20 to 29	Braking deceleration OR directional control is between Medium and Poor.	Medium to Poor
Greater than 1/8 inch (3mm) depth of: <ul style="list-style-type: none"> Dry Snow Wet Snow 	1		Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced.	Poor
Warmer than 5° F (-15°C) outside air temperature: <ul style="list-style-type: none"> Compacted Snow 	0	20 or Lower	Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain.	Nil
<ul style="list-style-type: none"> Wet Ice² Slush over Ice² Water over Compacted Snow² Dry Snow or Wet Snow over Ice² 	0			

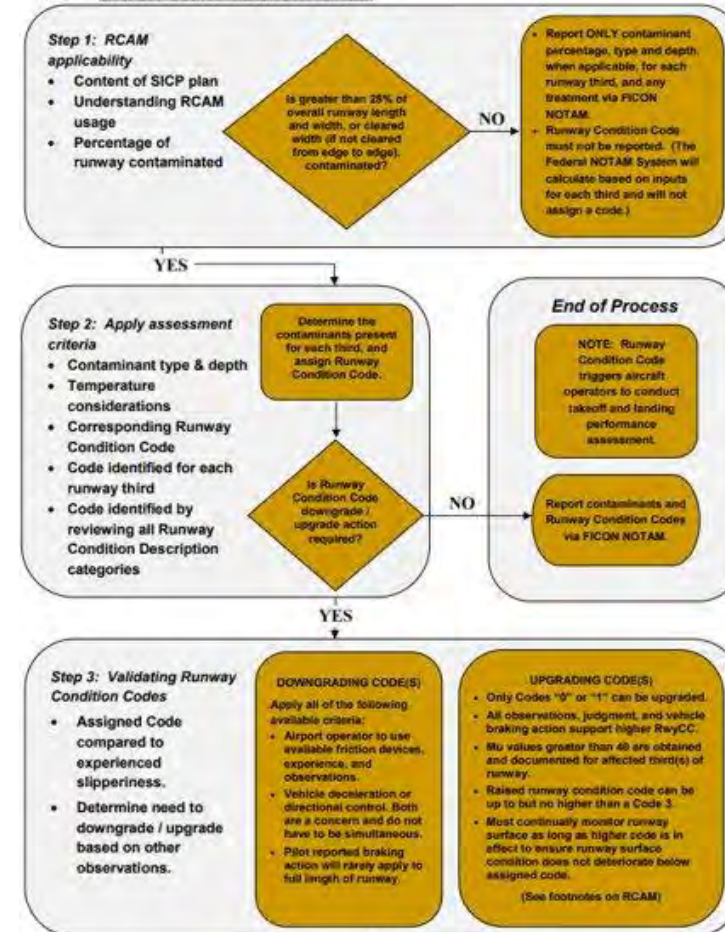
Important Definitions

RCC

Friction Values (Mu)

PRBA

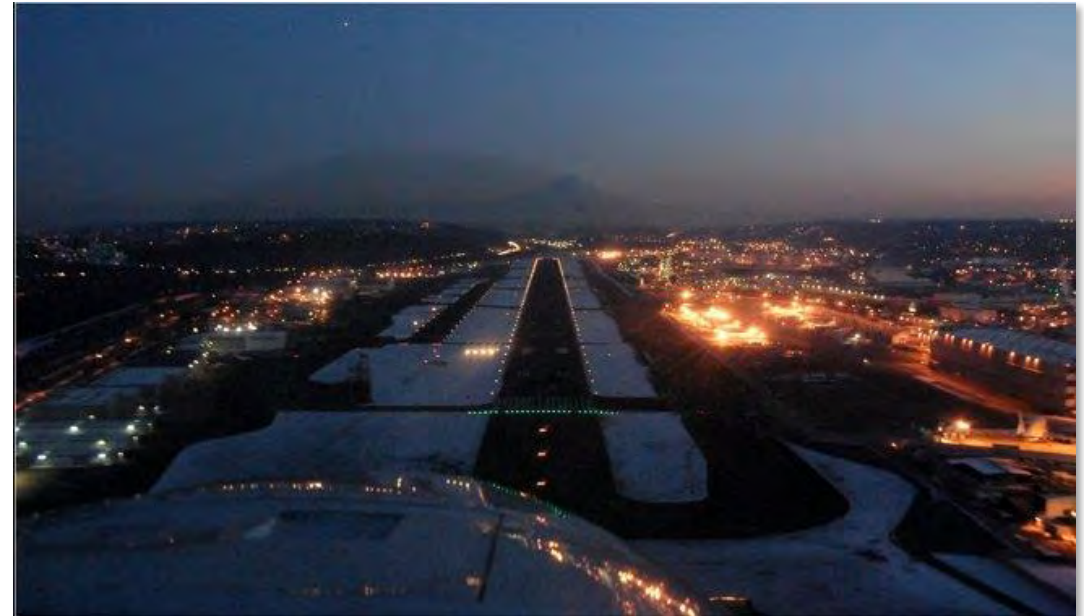
5.3.2 Overview of the Basic RCAM Process



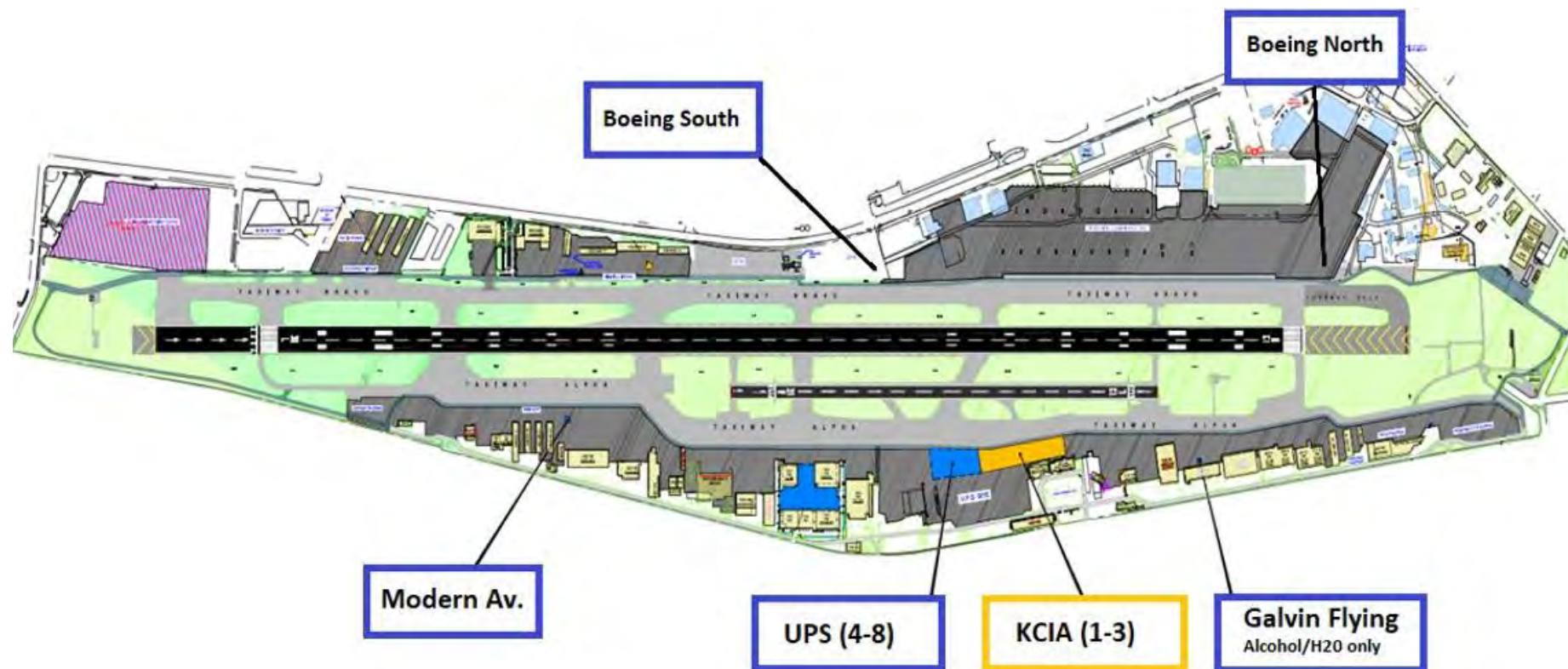
Surface Assessment and Reporting Pilot Reported Braking Action (PIREP)

Provided by pilots for other pilots

- Good
- Good to Medium
- Medium
- Medium to Poor
- Poor
 - *Two Poor reports after a Good/Medium, conduct assessment*
- Nil:
 - *By Pilot or Airport Ops, closes surface automatically*
- $\frac{1}{2}$ " Slush or 2" Dry Snow closes RWY



Aircraft Deicing



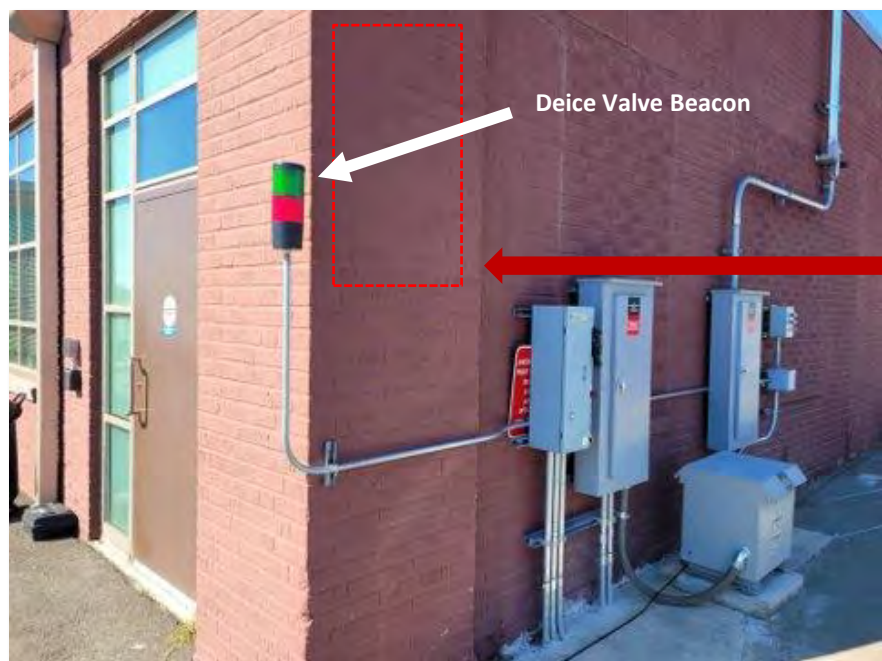
KCIA gates 1-3 are a first come first serve basis

- *Do not block Customs Blue Box*

Reminder; KCIA must collect the total number of gallons used of aircraft deicer

Aircraft Deicing KCIA Gate 3

- Prior to de-icing on Gates 1-3, the user must ensure the de-ice bypass valve is in Sewer Mode.
- User will look for a GREEN BEACON light illuminated at the corner of the Main Terminal Building.
 - If the beacon is RED, user will NOT de-ice until Operations is contacted to switch the system.



Post Event/ Season Actions

- **After each significant snow event**
 - 4th Quarter (Oct-Dec)
- **During Snow season**
- **Post Season**
 - 2nd Quarter (April)



Questions?

- Airport Operations/Snow Desk
 - Tel; 206-296-7334 -24HR
 - Alt 206-915-1415
 - Email; airportops@kingcounty.gov
 - Presentation available on KCIA's web page *under Info for Tenants - > Inclement Weather Operations*
- NOTAM/FICON
 - Notams.faim.faa.gov/notamsearch
 - ATIS 127.75
 - ASOS 206-763-6904
- FBO sponsored airfield webcam
 - www.wasar.org/webcams/

