



WINTER OPERATIONS STRATEGY

CAPE BRETON REGIONAL MUNICIPALITY
DEPARTMENT of
ENGINEERING AND PUBLIC WORKS

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1. PART 1 – PLAN OVERVIEW

1.1. MISSION STATEMENT

- 1.1.1. The mission of this strategy is to provide efficient, cost effective and consistent winter maintenance services within the capability of the resources available, for the safe passage of vehicular and pedestrian traffic on streets and sidewalks under the operational jurisdiction of the Cape Breton Regional Municipality.
- 1.1.2. Many elements including temperature, wind, forecast, time frame and available equipment must be considered with each snowfall, which may dictate slight variations to the snow plowing and/or de-icing operation. The overall intent, however, should remain intact.

1.2. RESPONSIBILITY

- 1.2.1. The CBRM Public Works Department shall be responsible for the administration of the Winter Operations Strategy.
- 1.2.2. This strategy will be reviewed formally with Council every 3 – 5 years to correspond with municipal snow removal contracts.

1.3. OBJECTIVES

- 1.3.1. Develop and implement procedures on snow and ice related operational priorities.
- 1.3.2. Document well defined levels of service for winter maintenance.
- 1.3.3. Establish reasonable and safe flow of vehicular and pedestrian traffic as quickly as possible after a winter storm event
- 1.3.4. Minimize disruption to local businesses and service providers during and after winter storm events.
- 1.3.5. To be responsive to the needs of the citizens of CBRM when travel is restricted during winter storm events and prioritize resources accordingly.
- 1.3.6. Encourage citizen participation in snow clearing operations by encouraging citizens to clear snow and ice from sidewalks, fire hydrants and catch basins.

1.4. JURISDICTIONS

- 1.4.1. Cape Breton Regional Municipality
 - 1.4.1.1. Streets and sidewalks in the former city of Sydney and former towns of Glace Bay, New Waterford, Dominion, Louisbourg, North Sydney, and Sydney Mines, as well as sidewalks and designated



streets and unlisted roads in the former County of Cape Breton are covered directly by this policy.

1.4.2. Nova Scotia Department of Transportation and Infrastructure Renewal

1.4.2.1. All Provincial roads and highways, in the former county of Cape Breton, including J-Class roads are ***not*** directly covered by this policy.

1.4.3. When it is in the best interest of the public and where mutual agreement occurs between CBRM and NSTIR, sections of plowing routes may be swapped between jurisdictions, through a plow route exchange.

1.5. STREET CLASIFICATIONS

1.5.1. Levels of service for winter maintenance operations must be realistic and be chosen to provide a suitable travel surface at a reasonable cost. This cost should be in balance with the need and the benefit derived. Street classifications are often used to delineate different levels of service. Higher traffic streets will usually require and can afford higher standards of winter maintenance than less travelled ones. Table 1 below summarizes the hierarchy of streets owned and maintained by the Municipality. Streets and their hierarchy are mapped as a layer in CBRM's ArcGIS.

**Table 1 - CBRM Street Hierarchy**

Level 1 – Primary Urban Arterials <ul style="list-style-type: none">▪ Arterial streets emanating from the central business district of the four major urban concentrations leading directly to a Level 1 road.▪ Main streets within the central business district in any of the four major urban concentrations
Level 2 – Major Urban / Suburban Collectors <ul style="list-style-type: none">▪ streets emanating from the core of one of the four major urban concentrations to intersect a level 1 road at a ramped intersection or one that is serviced with a fully actuated traffic signal▪ streets emanating from the core of one of the four major urban concentrations that become a secondary regional route▪ collector streets/roads linking two or more communities within one of the four urban concentrations▪ collector streets/roads linking a minor urban community to a Level 1 Road▪ main streets of a central business district with a significant commercial assessment base in a minor urban community that become a secondary regional route▪ urban/suburban collectors that link a Level 1 or 2 Road with a Level 1 or 2 Road
Level 3 – Minor Urban / Suburban Collectors <ul style="list-style-type: none">▪ collector streets channeling neighbourhood traffic to a primary urban/suburban collector▪ minor collectors in the central business district of one of the four major urban concentrations
Level 4 – Neighbourhood Through Streets <ul style="list-style-type: none">▪ streets mainly used by local traffic that also channel through traffic because they are direct routes linking two or more higher level streets or linking a higher-level street with a significant public complex▪ the one main street leading out of a very large subdivision/neighbourhood▪ all other downtown streets other than dead end streets▪ main streets through minor urban communities that are no larger than the neighbourhoods in the major urban concentrations▪ streets directly linking a main street with a working waterfront
Level 5 – Local Urban / Suburban Streets <ul style="list-style-type: none">▪ streets that only service local traffic



2. PART 2 – ROADWAY ICE CONTROL

1.6. GENERAL OBJECTIVES

- 1.6.1. During the winter season, it can be expected that streets and roads may be slippery due to ice and snow presence and further that the public must drive accordingly. Therefore, the objective is to make the streets and roads as safe and passable as can be reasonably expected under prevailing conditions.

1.7. STRATEGY

- 1.7.1. To facilitate practical, safe and cost-effective anti-icing and de-icing, operations, the following factors shall be taken into consideration:
- 1.7.2. Meteorological forecasts,
- 1.7.3. Time of day,
- 1.7.4. Intensity of storm,
- 1.7.5. Temperature,
- 1.7.6. Other pertinent data.
- 1.7.7. Salt trucks, equipped with snowplows, will be utilized whenever possible to minimize the quantity of salt required
- 1.7.8. Not all streets are salted every storm.
- 1.7.9. Anti-Icing of Primary Arterials, Major Collectors, Routes to Emergency Services, and designated hills will commence up to 4 hrs before the onset of a storm.
- 1.7.10. Other level streets where safety may be impacted such as intersections, super-elevated curves, railroad crossings, bridges, transit and school bus routes may be salted after plowing is complete.
- 1.7.11. In instances of extreme, prolonged cold temperatures the effectiveness of rock salt for de-icing can be diminished. Under such circumstances, a sand or salt/sand mix may be ‘spot’ applied as an interim mitigation.
- 1.7.12. The levels of service for Roadway Anti-Icing and De-Icing are summarized in Appendix 1.

3. PART 3 – ROADWAY PLOWING

3.1. GENERAL OBJECTIVES



3.1.1. The objective of street plowing is to allow for the safe passage of emergency vehicles and the public, to allow for the transit system to provide timely service to the public and to allow for local businesses, schools and other service providers to continue to operate.

3.1.2. As soon as a snowstorm subsides, the priority is to plow all streets in a practical and cost-efficient manner. However, should a snowstorm persist for an extended period, efforts will be focused on maintaining emergency routes and Major Urban Arterials reasonably passable.

3.2. STRATEGY

3.2.1. Street plowing shall have priority over all other snow-related tasks.

3.2.2. In order to be as efficient as possible, plows shall follow designated routes as specified by the divisional Public Works Operations Manager or designate.

3.2.3. Only for emergency fire or health situations, processed through the 911 System, shall the Manager or his designate instruct Plow Operators to break away from their designated route.

3.2.4. Generally, plows will be dispatched from central operations sites as close to the end of the storm as possible.

3.2.5. Plowing of Primary Arterials, Major Collectors and Routes to Emergency Services will commence after 5 – 8 cm of accumulation and snow is still falling.

3.2.6. To facilitate a practical, safe and cost-effective snow plowing procedure, plowing of all other street levels will commence after 8 – 10 cm of snow accumulation and snowfall is substantially complete, after taking into consideration meteorological forecasts, time of day, intensity of storm, temperature, etc.

3.2.7. All roads which the Municipality provides winter maintenance on, that are accessed via a Provincially owned and maintained road will be plowed within 8 hours after the Provincial Road has been plowed.

3.2.8. In the event of an extended storm, plowing will commence after 15 – 20 cm if snow is still falling.

3.2.9. In the event of an equipment breakdown, the remaining equipment available will provide mutual aid as they become available.

3.2.10. Should weather conditions deteriorate such that plowing becomes dangerous, the Public Works Operations Manager or his designate may suspend plowing operations until conditions improve.



- 3.2.11. Generally, streets and roads should be plowed to their full width during “normal” plowing operations. Winging back snow to widen a street after the normal plowing process is complete is sometimes necessary for safety and/or to make room for future snowfall.
- 3.2.12. The levels of service for the various classes of streets for street plowing operations are summarized in Appendix 2.
- 3.2.13. The Road Hierarchy for CBRM owned Roads is shown on the ArcGis Map.

4. PART 4 – SIDEWALK PLOWING AND ICE CONTROL

4.1. GENERAL OBJECTIVES

- 4.1.1. During the winter season, streets can be expected to be restricted by snow accumulation and at times slippery. Therefore, efforts to provide access for pedestrians to sidewalks on streets with high volumes of vehicle traffic is important.
- 4.1.2. Sidewalk service levels cannot match the service level provided to streets. This is due to the limited width of sidewalks, limited available space to store snow that is removed from sidewalks, no designated drainage system for sidewalks and the capabilities of the equipment.
- 4.1.3. The objective of establishing sidewalk priority levels is to allow for pedestrian traffic on the busiest sidewalks as quickly as possible after a storm, and then to continue plowing lower priority sidewalks as time and resources allow.

4.2. STRATEGY

- 4.2.1. Like roads, levels of service for winter maintenance of sidewalks must be realistic and chosen to provide a suitable travel surface at a reasonable cost. This cost should be in balance with the need and the benefit derived. Sidewalk Priority Levels are used to delineate different levels of service. Higher traffic sidewalks will usually require and can afford higher standards of winter maintenance than less travelled ones.
- 4.2.2. To the extent that financial and physical resources will allow, sidewalk priority levels are determined based on the objective criteria described below.
- 4.2.3. Objective Criteria for Sidewalk Priority Levels:
- 4.2.4. Priority 1 Sidewalks are identified on CBRM’s Arc GIS Map and include:
 - 4.2.4.1. Sidewalks on Major Arterial and Collector Routes.
 - 4.2.4.2. Sidewalks in Central Business Districts



- 4.2.4.3. Sidewalks adjacent to schools and hospitals
- 4.2.5. Priority 2 Sidewalks are identified on CBRM's Arc GIS Map and include:
 - 4.2.5.1. Sidewalks on Minor Collector Routes
 - 4.2.5.2. Sidewalks on Transit Routes
 - 4.2.5.3. Sidewalks on significant pedestrian corridors on lower level streets.
- 4.2.6. Priority 3 Sidewalks are identified on CBRM's Arc GIS Map and include:
 - 4.2.6.1. Remaining sidewalks on designated Transit Routes
 - 4.2.6.2. Sidewalks on less busy streets, based on available resources.
- 4.2.7. Rural Sidewalks are identified as a layer on CBRM's Arc GIS Map and include:
 - 4.2.7.1. Sidewalks adjacent to Provincially owned roads with high traffic counts
 - 4.2.7.2. Sidewalks adjacent to Provincially owned roads in school zones.
 - 4.2.7.3. These sidewalks are generally maintained by contractors.
- 4.2.8. The levels of service for sidewalk plowing / de-icing are summarized in Appendix 3.
- 4.2.9. In the interest of efficiency and continuity, routes will be designated by the Public Works Manager of Operations. Sidewalk priorities are identified as a layer in CBRM's ArcGIS mapping.
- 4.2.10. The designated route will be followed to provide continuity. If another snow event occurs before all priority sidewalks are plowed, equipment will start over at the beginning of the highest priority designated route
- 4.2.11. Sidewalk routes will be routinely checked for sanding/salting requirements.
- 4.2.12. Rural sidewalks maintained by contractors shall be completed following the terms and conditions of the contract, including the coordination of their plowing and/or salting/sanding with the Nova Scotia Department of Transportation and Public Works to avoid conflicts and the necessity to re-plow, etc.

5. PART 5 – SNOW CLEARING / REMOVAL

5.1. GENERAL OBJECTIVES



- 5.1.1. The process of plowing streets results in snow accumulation, which restricts lane widths and sight distances. Access to other Municipal infrastructure can also become hindered due to excessive snowfall and/or the plowing procedure.
- 5.1.2. Therefore, some areas will require that excessive snow accumulation be cleared or removed, due to their physical layout and volume of traffic.
- 5.1.3. When the location of the infrastructure allows for it, snow will be cleared (moved to an area adjacent to the infrastructure) to allow access to the affected infrastructure. Examples where clearing is generally used would be bus shelters, catch basins and fire hydrants, intersections).
- 5.1.4. When the location does not allow for clearing, snow accumulation will be removed. (trucked away). Snow is removed from downtown business districts.
- 5.2. STRATEGY
 - 5.2.1. Snow clearing / removal activities will take place when accumulation warrants and as soon as time, equipment and materials allow.
 - 5.2.2. Snow clearing / removal levels of service are summarized in Appendix 4

APPENDIX 1 - ROADWAY ANTI-ICING AND DE-ICING LEVELS OF SERVICE

Road Category	Example	Winter Service Level ¹	Product	Application Timing
Level 1 (Primary Arterial)	Central – Kings Rd East – Reserve St North – King St	Bare Pavement	100% Rock Salt	Anti-Ice up to 4hrs before the onset of a storm De-Ice 'only' Up to 5 cm of Accumulation De-Ice after plowing complete 1-2 hrs to Complete Route
Level 2 (Major Collector)	Central - Lingan Rd East - Heelan St North - Purves St	Bare Pavement	100% Rock Salt	Anti-Ice up to 4hrs before the onset of a storm De-Ice 'only' Up to 5 cm of Accumulation De-Ice after plowing complete 1-2 hrs to Complete Route
Level 3 (Minor Collector)	Central – Cottage Rd East – Sterling Rd North – Regent St	Safe and Passable	100% Rock Salt	De-Icing will start after plowing is complete as conditions warrant. All Level 3 Roads will not be salted every storm.
All Other Levels		Safe and Passable	100% Rock Salt	No Anti-Icing and generally no de-Icing on these Roads. De-Icing only when extreme conditions warrant and after plowing.
Local Streets with Hills	Ex. Church St, Syd	Bare Pavement	100% Rock Salt	Anti-Ice up to 4hrs before the onset of a storm De-Ice 'only' Up to 5 cm of Accumulation De-Ice after plowing complete 1-2 hrs to Complete Route
Routes to Emergency Services	Martha Boulevard, Syd (Route to Regional Hospital)	Bare Pavement	100% Rock Salt	Anti-Ice up to 4hrs before the onset of a storm De-Ice 'only' Up to 5 cm of Accumulation De-Ice after plowing complete 1-2 hrs to Complete Route
All Levels		Safe and Passable	Sand or Salt / Sand Mix	Sand or Salt/Sand mix applied on an as needed basis where icy conditions are creating a safety hazard for motorists.

Notes:

1. This is the desired condition of the roadway surface after a storm. The time to achieve these conditions will vary depending on weather conditions.

APPENDIX 2 - ROADWAY PLOWING LEVELS OF SERVICE

Road Category	Pavement Condition at Completion of Plowing	Plowing to Commence after Accumulation of (cm)	Target Time to Complete Plowing (Hrs) after snowfall has stopped ^{4,5}
Level 1 (Primary Arterial)	Bare Pavement	5 - 8 cm and still snowing ¹	6 - 8 hrs
Level 2 (Major Collectors)	Bare Pavement	5 - 8 cm and still snowing ¹	6 - 8 hrs
Routes to Emergency Services	Bare Pavement	5 - 8 cm and still snowing ¹	6 - 8 hrs
All Other Levels	Safe and Passable	8 - 10 cm snow stopped ² 15 - 20 cm and still snowing ³	8 - 12 hrs
Unlisted Roads	Safe and Passable	8 - 10 cm snow stopped ²	12 hrs ⁶

Notes:

- 1. Primary Arteries, Major Collectors and Routes to Emergency Services are plowed continuously during a snow event.
- 2, 3. As a general rule, plows are not dispatched to these roads until snowfall is substantially complete. When Major Storms (30 + cm) are forecast, these roads will be started after 15 - 20 cm of accumulation when it is still snowing.
- 4. These are target levels of service. Extreme weather events (30 + cm) may lengthen these times
- 5. This does not include wing back of windrows and widening of travel way after initial plowing
- 6. Unlisted Roads and Municipally owned roads accessed by Provincially owned / maintained roads will be plowed as quickly as possible after the Provincial Road has been plowed.

APPENDIX 3 - SIDEWALK PLOWING / DE-ICING LEVEL OF SERVICE

Category ⁴	Plowing to Commence after Accumulation of (cm)	Type of Operation	Target Time to Complete Plowing (Hrs) after Road plowing is complete
Priority 1 Sidewalks ¹	8 - 10 cm (or when de-icing is insufficient)	Full Operation (Overtime if Required)	24 hrs
Priority 2 Sidewalks ²	8 - 10 cm (or when de-icing is insufficient)	Full Operation (Overtime if Required)	36 - 48 hrs
Priority 3 Sidewalks ³	8 - 10 cm (or when de-icing is insufficient)	Partial Operation (Regularly Scheduled Shifts)	3 - 5 days
Rural Sidewalks ⁴	8 - 10 cm (or when de-icing is insufficient)	Full Operation (Contracted Service)	24 - 48 hrs

Notes:

1. Priority 1 Sidewalks are located on Major Arterial and Collector routes, Downtown Business Districts and Routes to schools and hospitals
2. Priority 2 Sidewalks include sidewalks on Minor Collector Routes, Transit Routes and high pedestrian traffic corridors.
3. Priority 3 Sidewalks are located in residential areas and provide access corridors for residents.
4. Rural sidewalks are located adjacent to Provincially maintained roads and streets. The timing of plowing of these sidewalks is affected by the provincial levels of service for highway plowing.
5. Not all sidewalks receive winter maintenance. Approximately 60% of Sidewalks are maintained for snow and ice removal by the Municipality

APPENDIX 4 - SNOW CLEARING / REMOVAL LEVEL OF SERVICE

Category	Net Snow Accumulation for Clearing / Removal	Type of Operation	Target Time to complete removal after road plowing is complete
Bus Shelters	15 - 20 cm	Partial Operation (Regularly Scheduled Shifts)	36 - 48 hrs
Downtown Business Districts	40 + cm	Full Operation (Overtime if Required)	3 - 5 days
School Frontages	40 + cm	Full Operation (Overtime if Required)	1 week
Dead Ends / Cul de Sacs	When lack of storage area starts to impact traffic.	Partial Operation (Regularly Scheduled Shifts)	1 weeks
Intersections	When traffic sight lines are affected	Partial Operation (Regularly Scheduled Shifts)	1 weeks
Fire Hydrants	30 + cm	Partial Operation (Regularly Scheduled Shifts)	2 weeks
Catch Basins	When melting can be expected, and flow would be restricted	Partial Operation (Regularly Scheduled Shifts)	2 weeks