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City of St. John's

Review of Winter Maintenance Services

Interim Report

October, 2014

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Mandate

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ST. JOHN'S
NEWFOUNDLAND AND LABRADOR, CANADA

Quick Hits

Mandate

The Winter Maintenance Operations Review is to cover:

- Roads Division Winter Maintenance services
  - Covers snow and ice control on roads and sidewalk
  - Services include pre-treatment, salting/sanding, plowing, snow removal, snow disposal/storage
- Parks and Open Spaces Division Winter Maintenance services, which include:
  - Snow clearing at parks, civic buildings, pedestrian crosswalks, pedestrian stairways and other publicly accessible areas
- Fleet Services Division support to the above operations

- The goals of the project are to
  - Review levels of service
  - Find lowest cost approach to achieve that level of service reliably
  - Identify mid- to long-term changes that may be required due to growth, changing regulations
- Our first report outlined how these services are provided now, and this report identifies the potential changes that were discussed in the consultation phase and identifies some Quick Hits – changes that can be adopted now for implementation this fall.

Project Schedule

Kick-off Meeting — June 4

Early Consultation Process — June 23 to July 31

- Release this “As Is” Report
- Launch consultation process
- Launch benchmarking of other cities

Analysis Phase — beginning August 1

- Interim Report identifies list of options to examine, and Quick Hits for implementation this winter
- Steering Committee confirms options and Quick Hits
- Options are analyzed to identify implications

Consultation/Review of Draft Report Findings — October

- Present findings of analysis
- Invite public and stakeholder comments

Final Report — October/November

Stakeholder Consultation Process

The process to date has involved gathering comments, suggestions and information from a wide range of stakeholders:

External Stakeholders

1. Downtown St. John's
2. George Street Association
3. Happy City
4. Metrobus
5. Canada Post
6. NL English School District (City Reps)
7. Memorial University (MUN Traffic Study)

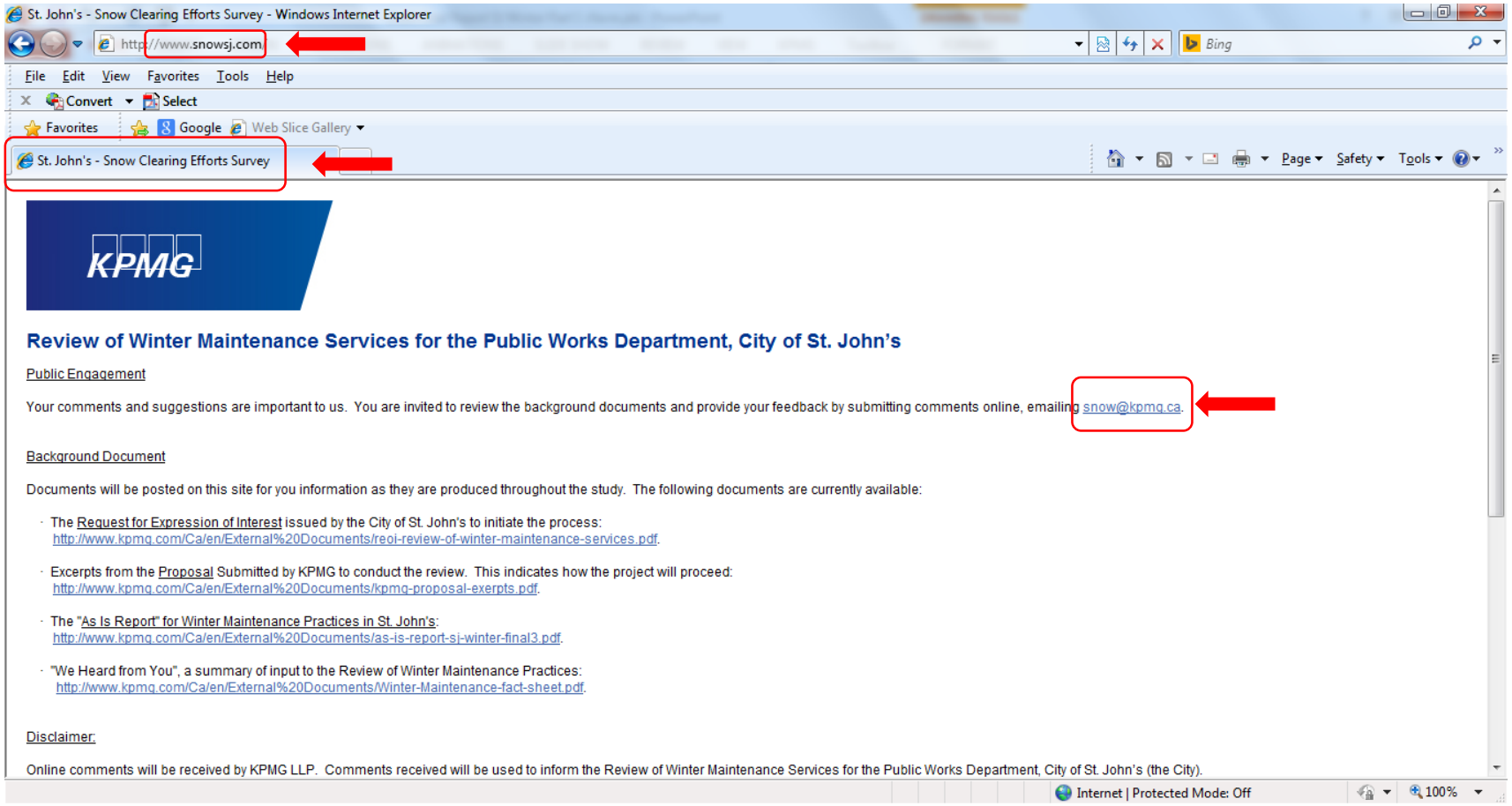
8) Coalition of Persons with Disabilities

Internal Stakeholders

1. Winter Maintenance Staff group and individual sessions
2. Foremen
3. Union Executive
4. Council
5. Steering Committee
6. Management in Public Works, Roads, Fleet Services, Supply, Communications, etc.

In addition to these targeted consultations, two public meetings were held that were open to both residents and staff, reports have been published on-line, the opportunity to provide comments on-line or by email has been provided, and all has been promoted on the web-site and by social media.

Online Comments



Planned Consultation

- Additional consultation with key stakeholders will occur as the final report is being prepared, including:
  - Group meetings with roads forepersons and Fleet/Supply group
  - Staff/Union consultation
- A Preliminary Draft Final Report will be prepared in early October. It will be open for consultation with:
  - Steering Committee
  - Council
  - CUPE Executive and Union members
  - The Public including both residents and staff:
    - Report (in draft) will be posted on line, along with a summary
    - The report and the public workshops will be advertised:
      - Post time and place on-line
      - Issue press release/public service announcement
      - Send email notice to all previous responders and stakeholders
      - Use Twitter, Facebook and other social media
    - Two public workshops will be held, one downtown and one elsewhere
    - By email or on-line comment

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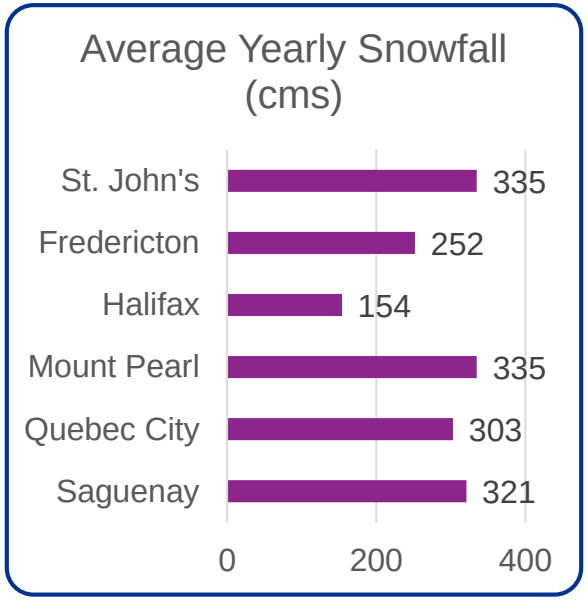
Issues Identified

Comparison Cities for Winter Maintenance

The table below compares the characteristics of the selected cities examined as part of this review. Data collection and analysis continues for the Final Report which will contain the over-all findings, but some preliminary findings are included in this Interim Report.

	Population	Ave. Snowfall	Lane kms of Roads	Lane kms/capita	Notes
St. John's	106172	335	1400	0.013	Narrow streets, steep hills, large rural area
Fredericton	56,000	252	719	0.013	Provincial capital, lowest density
Halifax	390,096	154	3,860	0.010	Provincial capital, lots of hills
Mount Pearl	24284	335	240	0.010	Similar snow load
Quebec City	530,163	303	6,569	0.012	Provincial capital, some old, narrow steep areas
Saguenay	144,746	321	2,400	0.017	Similar size and snowfall, but data incomplete



Vehicles and Equipment for Winter Maintenance

Vehicle and equipment availability/reliability was a major problem last winter, severely constraining the ability of the Roads Department to maintain the streets and sidewalks and to conduct snow removal operations in a timely manner.

While many readers are likely more interested in the service level issues, this section is placed first in the report to indicate that actual service levels will be much better than last year if the equipment maintenance issues are resolved.

Vehicles and Equipment for Winter Maintenance

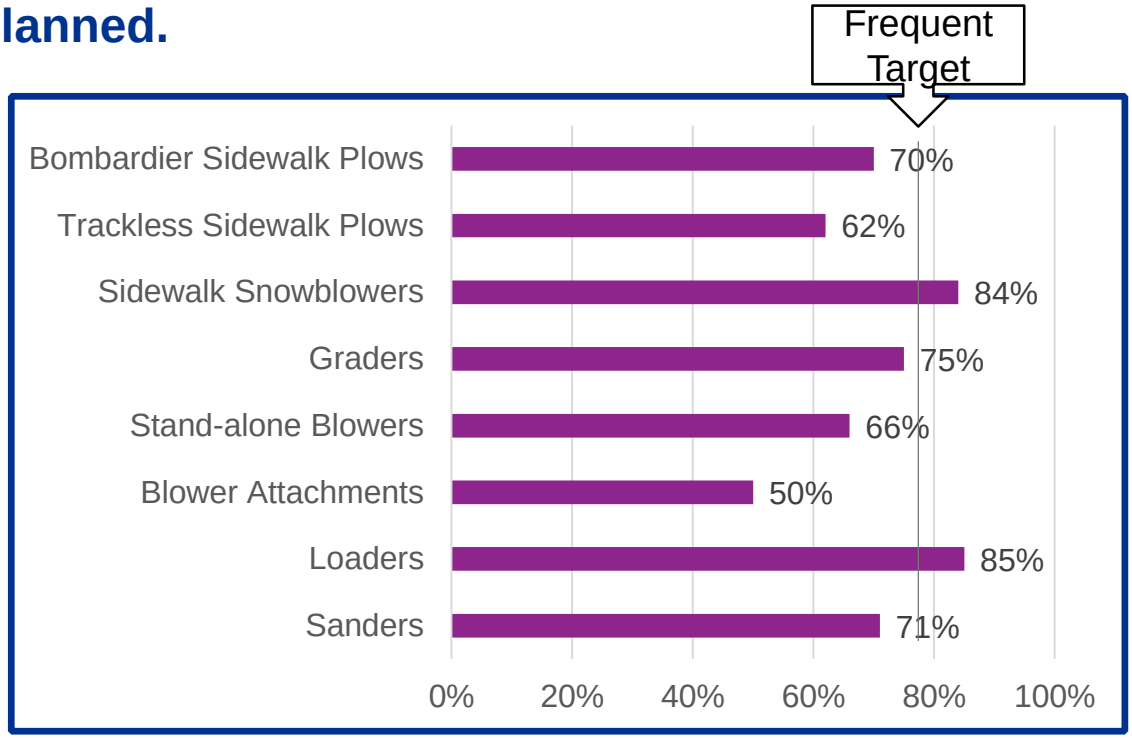
The vehicles used for winter control are generally appropriate, with a strong emphasis on multi-use vehicles.

- The City places a strong emphasis on the salt/sand truck (sander) as the basis of its winter control fleet and equips them for plowing as well as salting, which is consistent with best practices. The vehicles provide for pre-wetting the salt before distribution which reduces salt requirements and improves effectiveness. The use of the same vehicles for snow removal and as dump trucks in the summer is unusual and gets enormous value out of the vehicles.
- The City uses more loaders for plowing deep snow than many cities (as opposed to graders), which gives it the capacity to handle the deep, heavy snow in St. John's. The loaders are also multi-use, with the blower attachments giving a second major function for snow blowing and removal.
- The sidewalk equipment, the tracked Bombardier and Trackless vehicles are consistent with those used elsewhere and also have attachments that allow them to serve as snow blowers (smaller scale).
- The City has invested in some specialized equipment. The Swiss snow blowers handle good volumes but have reliability and parts availability issues. The large new anti-icing vehicles are very versatile (for winter uses), handling brine distribution, salting and plowing. The City is trying some small loaders and four wheel drive trucks for salting and plowing the very narrow, hilly streets downtown.

Vehicles and Equipment for Winter Maintenance

However, there were often not enough vehicles available to carry out winter maintenance operations as planned.

Fleet Services reports on the availability of equipment. Last year the average availability was as shown at right, frequently below 80%, a relatively low target used by some other cities.



Roads Division tracked equipment condition as well, and often reported lower availability either because vehicles (particularly for sidewalk plows) would not start after sitting outside the maintenance shop overnight or because equipment breakdowns occurred during the first shift.

Vehicles and Equipment for Winter Maintenance

The analysis and interviews suggests a number of factors which may have contributed to the problem:

- Difficulty in obtaining parts to carry out repairs, which in turn may have been caused by:
  - Inadequate inventory
  - having too many types of equipment requiring too many types of parts to be kept
- Damage caused by operations resulting from inadequate training of operators or other factors resulting in unnecessary breakdowns.
- Outdoor storage of vehicles, particularly sidewalk plows and blower attachments for loaders
- Failure to complete annual maintenance and inspections
- Inefficient Fleet operations
- Poor communications between Fleet, Roads and Supply

Vehicles and Equipment for Winter Maintenance

There are a number of steps that can be taken this year to improve vehicle and equipment availability:

- Improve operator training on vehicle damage issues (see QH6 (Quick Hit #6))
- Make use of hired trucks for snow removal whenever sufficient City trucks and operators are not available (see QH1)
- Improve communications between Roads, Fleet and Supply (see QH4)
- Provide indoor parking for sidewalk equipment (QH3) to reduce failure rates.
- Contract out seasonal inspections/refurbs if Fleet unable to ensure complete (QH8)
- Give fleet services an unfiltered internet access to allow parts searches, manual reviews, etc. (QH8)

Vehicles and Equipment for Winter Maintenance

There are other areas for possible improvement that will be reviewed further for the Final Report:

- Improvement in parts inventory management, which could include:
  - Improved training / processes / software to ensure effective, systematic review of parts usage and optimal parts inventory holdings
  - Could involve making more use (better training, allocation of responsibility) of inventory requirements analysis capacity of current inventory management system (Microsoft Dynamics Great Plains), or acquiring additional capacity through contract or add-on software
- Looking at the structure and reporting between Roads, Fleet and Supply and the need for changes to ensure permanent improvement in communication and cooperation
  - Does Roads need a position of vehicle/equipment inspector/co-ordinator parts inventory monitor?
  - Should the parts group in Supply become part of Fleet?
  - What change in responsibility or structure is required to improve the parts availability?
- An approach to providing indoor storage/attachment space for blower attachments

Vehicles and Equipment for Winter Maintenance

Other areas for possible improvement that will be reviewed further for the Final Report:

- Improve standardization of vehicles/equipment – buy fewer specialized units, buy in bigger groups (rather than a few at a time) and/or tender for multi-year deliveries together, so one unit purchased over a number of years
- Expand the lease concept used with loaders (contractor suppliers loader and any required maintenance)
  - Use concept for blower attachments?
  - Use the concept with sidewalk Bombardiers
- Accept mechanics with heavy equipment ticket, don't need light ticket as well
- Consider the appropriate lifecycle for blower attachments (near the end?)
- Consider the need for more trucks – as spares, to cover additional routes
- Provide indoor storage/attachment space for blower attachments, second priority for sidewalk equipment use compound for towed vehicles (parking compound) – use old bus storage facility
- Align shifts between Fleet and Roads better to improve communications and coordination

Pedestrian Concerns

There was a consistent message from the public, from staff, from businesses and from other stakeholders that the City does not do enough for pedestrians in the winter.

- While sidewalks were a major focus, crosswalks, signal activation buttons, bus stops and generally pedestrian safety received attention. Everyone is a pedestrian for part of their trip, but children in school, university students, downtown workers, shoppers, residents and patrons, and people with disabilities or low incomes are very frequent pedestrians.

Pedestrian Concerns

- Most cities (but not all - see the table on the following page) provide higher service levels for pedestrians, and there is a continuing trend towards improving sidewalk and pedestrian service levels:
  - Fredericton and Halifax plow all their sidewalks (Halifax adding the last group recently)
  - Mount Pearl maintains all sidewalks, including those on residential streets
  - Quebec plows both sides on primary and secondary arterials, one side on all collector roads, plus the sidewalk in front of any schools, medical, senior citizen homes, medium or high density housing, commercial sectors bus routes, areas with lots of parking on the street, roads less than 6.5 m, wide - daycare centres (>6 kids), and mobility reduced residents also considered – however sidewalks that are rarely used may be dropped from list, new areas where there is not enough snow storage area are generally not done. Also have criteria for pathways that don't follow the street
  - St John's criteria are much tighter than any of the other cities examined.

Levels of Service on Sidewalks

The Levels of Service for sidewalks used by the comparison cities are shown in the table below.

	Sidewalks Maintained	Commercial Core	Timing
St. John's	One side of arterial and collector roads within 1.6 kms. of schools, and those adjacent to hospitals, seniors complexes and City facilities – 19% of all sidewalks	Business's responsibility. City pays 50% of contract	Starts second shift after snow stops (18 to 24 hours after snow stops)
Fredericton	All	By City	Complete after 48 hours
Halifax	All (recent expansion)	Part of P1 sidewalk routes, plow at 5 cms	P1s 12 hours after storm, P2s 18 hours (if 10 cms or more), P3s start after P1 and P2, complete at 36 hrs
Mount Pearl	All	By City	Main streets, school zones 4-6 hours, rest 5 to 7 days
Quebec City	Most where there is any indication on need - new areas where there is not enough snow storage area generally not done.	P1 (high usage), salt before and after, plow after 5 cms	P1 salt before and after, plow at 5 cms P2 sand for freezing rain, after storm, plow after 5 cms P3 sand during freezing rain, and icy areas after snow - plow after 10 cms. Complete 4 hours after snow <15 cm, 6 hours after snow <22 cm, 8 hours after snow >22 cms.
Saguenay	All	By 7:30 am (unless still snowing heavily after 4 am)	School zones/core by 7:30 am, all sidewalks within 24 hours

All maintain far more sidewalks than St. John's, including the downtown core. All start sidewalk clearing sooner than St. John's (e.g. during the storm). The larger cities use a priority system on their sidewalks – like the one used by all on the roads, giving some sidewalks priority over others.

Pedestrian Concerns

When sidewalks are done, they are not done as well or as quickly as other cities.

- Halifax and Quebec City have priority systems for their sidewalks
  - Halifax P1 includes sidewalks on arterials and in the capital district. Plowing start at 5 cms. of snow and is completed 12 hrs. after the end of the snowfall. P2 includes school drop off areas and transit routes (not on arterials). Plowing starts at 10 cms, and is completed at 18 hrs. P3 includes the residential areas and plowing starts when P1 and P2 are completed, and is finished 36 hrs. after the snowfall ends. Halifax clears 3600 bus stops within 48 hours (formerly 72)
  - Quebec P1 sidewalks are all high use walks and those with over 8% grade. They are salted during freezing rain, during the beginning of any snowfall they salt the hills and stairs, begin plowing after 5 cms. and then salt after snowfall ends. P2 sidewalks include those serving schools, with a grade >5%, or with a particular issue (seniors, limited mobility resident). They are plowed at 5 cms., but generally receive sand for freezing rain, or after snowfall ends. The P3s are not plowed until there is 10 cms., and they get sand or salt only at intersections, pedestrian crossings, or slippery areas.

Pedestrian Concerns

When sidewalks are done, they are not done as well or as quickly as other cities:

- Mount Pearl completes streets and sidewalks in school zones 4-6 hours after snow stops
- Fredericton targets completion of all sidewalks 48 hours after snowfall ends
- St. John's does not start sidewalk work until the shift after the shift when the snow ends – which is generally 18 to 24 hours later, with completion taking several days after a large storm as the plows deal with snow pushed from roads onto sidewalks

Pedestrian Concerns

There are a number of steps that can be taken this year to improve pedestrian safety and comfort:

- Salt sidewalks before snowfalls when possible (QH1)
- Start sidewalk plowing for any storm expected to deliver over 5 cms of snow as soon as snow accumulations begin (QH1)
- Begin snow removal, using hired trucks, as soon as that is required to keep the sidewalk open (QH1)
- Create a dedicated sidewalk crew that will work day shifts, to attract skilled operators and ensure consistent attention to sidewalks (QH3)
- Do pedestrian counts on various sidewalks this fall to provide a basis for deciding which to add to the winter maintenance list (QH8)

Pedestrian Concerns

Other areas for possible improvement that will be reviewed further for the Final Report:

- Establish a new policy on which sidewalks will be cleared, considering whether to include:
  - All sidewalks on roads designated as P1 (highest priority) based on function/car volumes (not hilliness) – one side or both?
  - All sidewalks on P2 roads with bus routes – one side or both?
  - All sidewalks that have a high volume of pedestrians (measured in spring/ or fall)
  - All sidewalks on P2 roads leading to schools– one side or both?
  - All sidewalks leading to Memorial, as identified in the MUN Traffic Study
  - Any other sidewalks fronting schools, seniors complexes and City-owned facilities?
- When a sidewalk plow needs to blow snow back onto a roadway, can snow removal be conducted at the same time – at least in some circumstances?
- Provide clear access to pedestrian crossing buttons much more quickly after a storm – looking to those where sidewalks will still not receive early attention.
- The need for a planned approach to eliminating utility poles or other barriers between roadways and sidewalks or infringing on roadways or sidewalks that inhibit snow operations over time

The Commercial Core (Water, Duckworth, George)

Most cities make snow clearance in downtown commercial areas a priority. Water Street and Duckworth Street have been impassable at times. Snow has been piled eight feet high along the busiest sidewalks in the city. Inconveniencing parkers seems to have been a higher priority than pedestrian safety and comfort once people get out of the cars.

- This is the only area in the city where landowners pay extra for sidewalk clearance
- It is the only area where sidewalk maintenance is handled under a contract managed by a separate body, with little coordination with the City programs for road clearance or snow removal
- Other cities put extra resources into maintaining an attractive pedestrian environment in their key shopping and entertainment districts – even if they don't have an important tourism focus
- All the cities we examined clear sidewalks in commercial areas and none have any continuing requirements that landowners pay directly for sidewalk clearing. All include commercial areas in their high priority snow removal programs.

The Commercial Core (Water, Duckworth, George)

There are a number of steps that can be taken this year:

- Conduct snow removal after every storm over 10 cms, including any before Christmas. Use hired trucks to allow removal to start before plowing and push back activities elsewhere are completed (QH1)
- Depending upon the timing of a snow fall, for any snowfall starting late in the day, conduct pre-salting on George Street to help the first night of a snowfall, and later removal (QH1)

The Commercial Core (Water, Duckworth, George)

Other areas for possible improvement that will be reviewed further for the Final Report:

- Getting the timing and parking restrictions right can facilitate snow removal in the commercial core while minimizing business interruption. Should the approach include:
  - Focus snow removal activities on Sunday to Wednesday (do residential areas Thurs. to Sat.)
  - Conduct removal on George Street in the daytime/morning?
  - Open more city parking spaces for nighttime use downtown (charge for parking)
  - Enhance enforcement on parking violators (removing vehicles immediately if parked in contravention of snow clearing efforts)
- There are some aspects of the Downtown St. John's sidewalk maintenance contract that could be reviewed for possible change, with appropriate City contributions, should it include:
  - include salting sidewalks before a storm
  - start plowing after 5 cms. of snowfall instead of 10 cms.
  - include snow removal as well
  - Improve supervision of sidewalk contractor and coordination with City operations
- Do some pre-salting to help first night, and later removal

Roadway Maintenance

Roadway snow maintenance has generally been good, and consistent with other cities. However there have been some particular issues (missed streets, cul-de-sac treatment) that have been raised, and some areas where cost reduction may be possible by applying different standards or approaches. In particular, most of our comparison cities try to achieve passable, snow packed residential streets, while St. John's and Mount Pearl aim for bare pavement.

	Complete Plow on Arterials (after snow stops)	**Complete Plow on Residentials (after snow)**	**Conditions (arterials / residentials)**
St. John's	generally 12 hours	generally 24 hours	Bare / **Bare**
Fredericton	12 - 24 hours (all roads)		Bare / **Snow packed**
Halifax	plow/salt every three hours, clear of snow 12 hours after end of snow	cut through at 10 cms, passable 24 hours after snow ends	Bare / **Snow packed**
Mount Pearl	pre-treat and plow from start of snow, add loaders when required	4-6 hours after storm all roads cleared and pushed back to curb	Bare / **Bare**
Quebec City	During snow, plow from beginning and salt or sand/salt intersections, bus stops, school zones, hills, and slippery areas. Plow every 5 or 10 cms., complete 4 hours after snow <15 cm, 6 hours after snow <22 cm, 8 hours after snow >22 cms.	During storm salt intersections, pedestrian crossing areas, slippery areas. Plow after 10 cms	Bare / **Snow packed**
Saguenay	8-14 hours (based on snowfall)	24 hours	Bare / **Snow packed**

Roadway Maintenance

The system of salting and plowing routes used is quite sophisticated, using GIS software for planning, balancing and developing a desired sequence for handling each route (the “critical path”). While this is an excellent tool and approach, there may be opportunities to improve the system. Some routes have very few P1 roads, some have almost nothing but P1s. Some routes in growing areas are considered very long. Operators generally find the prescribed critical path for plowing or salting routes is inefficient, but the process for improving the critical paths has suffered from poor communications, and now from the departure of the person with skills to operate the system. Thus, it is not possible to fine tune the routes or the critical paths for this winter.

Roadway Maintenance

There are a number of steps that can be taken this year:

- Consider the “critical path” outlined for each route as a suggestion for operators, not a required sequence (QH8)
- Stop aiming for bare pavement on level residential streets and cul-de-sacs. Stop salting these streets and minimize the number of plow runs, ideally to two in each direction (after the snow stops) (QH2)

Roadway Maintenance

Other areas for possible improvement that will be reviewed further for the Final Report:

Routes and Route Mapping:

- Some alternative approaches to rationalizing the routes will be explored:
  - Ensuring all routes have a fair distribution of P1 roads, or
  - Redesigning the routes to make routes with a high ratio of P1 roads shorter, or
  - Increase the number of High Service routes to capture all (virtually all) continuous P1 roads, or
  - Moving to sequential routes – e.g. all equipment starts on P1 and P2 routes, then P3 & P4 routes are done after the P1 and P2 routes are completed
  - Splitting some of the longer routes in growth
- Determine whether to abandon the “critical path” concept, or improve it through:
  - Gaining more operator input on the critical path so routes reflect operating requirements better
  - Redesigning critical paths to catch small and scattered P2 and P3 sections while doing P1s, rather than deadheading back to get them much later
  - Perhaps using the “navigator” function of Route Smart to read routes to operators (like a GPS) or something similar
- Need for a new technician to use Route Smart for route mapping, and perhaps construction contract management in the summer)

Roadway Maintenance

Other areas for possible improvement that will be reviewed further for the Final Report:

Plowing Techniques:

- Do more echelon plowing, e.g. when leaving depot at start of shift, send two or three plows out together to do a major street or two, full width
- There is room to allow more flexibility to react to circumstances as they occur. A key consideration is who should have the ability to adapt from the plan, the operator or the foreperson for issues such as:
  - When traveling your route on a road that hasn't been plowed, should you put your blade down?
  - When you see that the salt isn't working, or conditions are worse than normal and you don't expect the normal salt application will work, can you increase salt application rates
  - Who can deviate from the critical path for their route
- What is the best way to improve communications between operators on different shifts to ensure that operators start their shift where the previous shift/operator left off so that entire routes are completed

Roadway Maintenance

Other areas for possible improvement that will be reviewed further for the Final Report:

Residential Streets:

- Identify approaches to stop plowing the middle path in each direction, so you get two lanes clear with opening cut in two directions (too long between runs and the initial cut drifts in – tempting the operator to try to clean the same area again)
- Identify approaches to minimize the frequency of passes down residential streets, while recognizing the need to retain snow storage capacity during early winter storms:
  - Limit to two passes in each direction after the storm – make second pass good and leave it at that
  - Later in the year do the first pass on local streets with the wing down, get it as wide as possible and don't do a second pass
  - Don't try to get back to curb after first storm
- Look at alternatives to reducing snow storage impacts on some cul-de-sac residents:
  - Plow to middle and remove snow when route around becomes impassable (would need a program – need snow dumps everywhere)
  - Continue to plow and blow onto front lawns, but spread the snow more evenly amongst properties on the cul-de-sac

Roadway Maintenance

Snow Removal Techniques

St. John's does a lot of snow removal because of the snow volumes and the narrow street in the older parts of town in particular. As noted earlier, more snow removal is required, which makes the cost of conducting snow removal and disposal a major concern.

Snow removal costs are higher than some other cities because of the safety rules imposed. A spotter walks in front of any snow blower in operation. This does reduce the chance of harm to any individual in the way (child in snow fort, person sleeping on snow bank) but is not a practice followed by other municipalities. St. John's also has a person block traffic at both ends of the street where removal is undertaken. This ensures no vehicles interrupt snow removal, but is also a practice other cities do not use.

On the other hand, St. John's has a very low cost approach to snow disposal, the envy of other cities. Depositing snow in the harbour reduces trucking costs (and diesel usage), places the salt (the major foreign substance in road snow) where it is not an environmental concern (as opposed to disposal on land) and minimizes the impact of trucking or disposal sites on residential areas or parks. There is concern this option could be lost, and over time, the City will need to remove snow from more areas outside the downtown, where the harbour would not be a good disposal option.

Virtually all snow removal in St. John's has used City vehicles. In practice this means snow removal cannot proceed until the push back is completed.

Snow Removal Techniques

There are a number of steps that can be taken this year:

- Use hired trucks to start snow removal earlier in the event (QH1)

Other areas for possible improvement that will be reviewed further for the Final Report:

- Reduce the cost of snow removal operations, perhaps by having a team leader who places unmanned barricades, inspects the areas to be removed for hazards and co-ordinates the equipment and trucks assigned to that crew (instead of a spotter, a replacement spotter, and two barricade manners)
- Expand public education to keep cars away from snow removal operations
- When removal is required and full crews are not available, make more use of “cut to curb” removal or one-side removal where feasible, with the emphasis on the volume removed more than the finished look
- Identify alternative approaches in case harbour disposal becomes constrained, and to meet long terms needs outside the downtown
  - Expanded use of Wishingwell Park and the landfill site
  - Use of snow melters
  - Acquiring large scale snow dump sites
  - Use of storm water retention ponds

Staffing

With virtually all winter maintenance services delivered by City staff, the recruitment, training, management and retention of that staff is key.

There are some important issues that impact operations. Most staff, including forepersons, are hired for the winter period (generally December to March). Many will be rehired for work over the summer period, but there is an employment gap in the spring, and again in the fall, for many employees. That leads to more turnover than might occur otherwise, and makes recruiting more challenging.

There is a particular challenge for forepersons as there are more forepersons required in winter than in summer, and the collective agreement limits the ability of staff to take foreperson jobs in the winter and CUPE position in the summer.

The result is that new operators, even those with equipment experience, need training every year in the particular equipment used in winter operations, and in the snow related techniques. When winter comes early, there is not much time for training, and higher equipment breakdown rates seem to be part of the result.

Last winter saw a late storm that came after most staff were laid off as well. While the remaining staff dealt with it, it took longer than usual to get things back to normal. On average, St. John's will have at least one snowfall each November and each April that requires a salting operation, with a 10 cm snowfall requiring a plow run at least once every two years.

Staffing

Other Cities do staffing differently.

- As the table at right indicates, St. John's and Mount Pearl are similar in terms of number of staff relative to population, although Mount Pearl has more per lane km. of road. Saguenay has similar staffing per lane km.

	t. John's	Fredericton	Halifax	Mount Pearl	Saguenay
Management	2	2	4	1	3
Supervisor	15	7	19	4	10
Operators	177	51	102	40	170
Labourers	18		58	6	20
Other	6				
	218	60	183	51	203
Staff/Supervisor	13.4	7.3	8.4	11.5	19.0
Staff/1000 Pop	2.1	1.1	0.5	2.1	1.4
Staff/100 Lane Kms	15.6	8.3	4.7	21.3	16.9

- However Fredericton and Halifax have far fewer staff. Fredericton runs with one shift, using more overtime during snow events. Halifax contracts work, both area contracts and using hired equipment.
- The other cities also work with regular annual staff who are more likely to be full-time and simply transferred between positions as seasons change. Both Halifax and Fredericton have small enough winter staffing they do more seasonal hiring in the summer. While we did not get numbers from Quebec City, their staff is also small due to extensive contracting and are also full-time, switching to water, sewer and road maintenance in the summer.
- Fredericton and Halifax start their winter season in mid-November, earlier than St. John's, while Mount Pearl starts a small night shift November 15 and the full winter staffing later, in mid-December. All three stay with winter staffing until the first or second week of April.

Staffing

Training

- St. John's has attempted to train new operators early in the season, but the early snowfalls last year resulted in the need to deploy staff as soon as possible. While new hires tend to have good heavy equipment experience, they tend not to have experience in operating the equipment for snow and ice control, and they generally do not have knowledge of the full range of equipment used by the City.
- The City has also had difficulty recruiting trainers among the current operators. There is a $3/hour extra benefit offered.
- Some of the other cities reported holding classroom sessions, for forepersons and for operators (Halifax), providing operator training using videos (Halifax), simulators (Quebec) and all use job shadowing, assigning a trainee to work with an experienced operator for some period of time.

Staffing

There are a number of steps that can be taken this year:

- Staffing for a longer (18 week instead of 16 week) season will provide resources for early or late events, and allow more time for training early in the season (QH5)
- Classroom training for both forepersons and operators in late November and early December (QH6)
- Recruit three operators to serve as trainers (one per shift) throughout the winter (QH6)

Other areas for possible improvement that will be reviewed further for the Final Report:

- Evaluate possible measures to improve operator retention:
  - Spread out summer work (asphalt in fall, clean-up in spring) so smaller summer workforce with little or no gap to winter work
  - Seek agreement to credit seasonal staff with seniority for accumulated time actually worked if they take other summer work but return to the City within a year
  - Be quicker to call staff in for snowfall before Dec 1 and recall staff laid off when late snowfall occurs
  - Seek an exemption to eliminate the use of log books
  - Eliminate compulsory use of the “critical path” and empower operator decisions (see Plowing Techniques)
  - Make trainer positions more attractive

Staffing

Other areas for possible improvement that will be reviewed further for the Final Report:

- Evaluate possible measures to build stronger forepersons:
  - Put more emphasis on snow experience when hiring forepersons
  - Seek agreement to allow forepersons to hold union positions in the summer, without a time limitation (provides opportunities for union members)
  - Give forepersons more delegated authority (empowerment) – ability to make changes in the plan based on evolving conditions (see plowing techniques) and the training required to use it effectively
- Develop the scope of possible enhanced training for all operators
  - use a train the trainer model, where senior operators provide hands on training to junior staff
  - Develop a training video featuring senior operators conducting snow clearing and removal
  - Examine the potential of simulator and on-line training resources
- Evaluate options to reduce staffing to one shift (like Fredericton) or two shifts, like Mount Pearl.

Contracting

St. John's does most of its snow operations in-house, using City staff and mostly City equipment. There are a couple exceptions. Most of the loaders are leased with the maintenance provided by the lessor. In extreme circumstances (like last winter) the City has hired extra trucks to assist with snow removal .

Most municipalities use a more balanced mix of in-house and contracted resources. This can give greater ability to adapt the resources to the nature of the winter. St. John's has the ability expand its resources by using overtime, generally running 12 hour shifts instead of 8 hour shifts during events. Beyond that it has very little flexibility and expanding the number of employees would increase costs almost as much in "good" winters as it would in hard winters.

Some municipalities use hired equipment as a significant part of their operations, calling in equipment (with operators) as required over the winter, but generally offering some kind of guarantee – either a minimum number of paid hours, or a flat weekly "standby" payment in addition to payment for hours worked.

Some use performance contracts – giving the contractor responsibility for a specific part of the operation. In Halifax, most sidewalk maintenance is contracted. In Winnipeg, it contracts all work on residential streets in a given area. Further details on the contracting approaches used by the comparator cities will be included in the Final Report.

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Contracting

There are a number of steps that can be taken this year:

- Use hired trucks on a regular basis to allow snow removal to begin earlier (QH1)

Other areas for possible improvement that will be reviewed further for the Final Report:

- Use hired equipment to supplement staff during major events. Loaders and graders would be the most readily available
- Consider expanding the scope of the Downtown St. John's contract to include some snow removal
- Contract some or all sidewalk plowing, perhaps tied to the expiry of the lifecycle of current equipment
- Build an approach to hiring equipment – ensuring that contracted resources are used in every winter, and have some guaranteed revenue, so contractors have some incentive to participate.

Regulations

St. John's imposes an on-street parking ban throughout the city (except the downtown) to facilitate snow operations. Last winter it was not imposed until January 8th, after a number of storms had created a difficult situation. Some suggest imposing the ban December 1st, however there often is no significant snow by that time, and occasionally for weeks after.

Fredericton and Mount Pearl have overnight on-street parking bans that last through the winter (start December 1) but Halifax and Quebec City have bans that take effect only during snow events – and Mount Pearl adds a ban at any time of day during a snow event. Quebec City has many streets with yellow lights that are turned on when parking is banned on them to accommodate snow operations.

The City has some authority to stop private property owners or their contractors from plowing snow from private parking lots onto City streets and sidewalks. However the legislation requires giving notice to the property owner and then providing a fine if the snow remains on the road or sidewalk. However the City must move quicker to remove the snow, and has a difficult time enforcing this regulation.

The City can tow cars that interfere with snow operations, however it then has to administer returning cars to owners and the impound lot takes up valuable space at the depot.

Regulations

There are a number of steps that can be taken this year:

- Implement the winter parking ban the first time there is a snowfall of 10 cms or more. (QH8)
- Grant home care workers a permit allowing on-street parking at night in winter. (QH8)

Other areas for possible improvement that will be reviewed further for the Final Report:

- Look at options to eliminate the car impound at the depot
  - Develop the ability to fine an owner for parking in a snow area, but just tow vehicle around the corner. Hire a tow truck by the hour when parked cars are an issue
  - Seek an agreement with a private towing company to have them tow, impound and return cars to their owners
- Seek a legislative change to allow the City to fine property owners when they or their contractors dump snow from parking lots onto the street or sidewalk (eliminate the need for a warning). Failing that, develop a program to charge back the costs of removal to the property owners, recognizing this would require more resources

External Communications

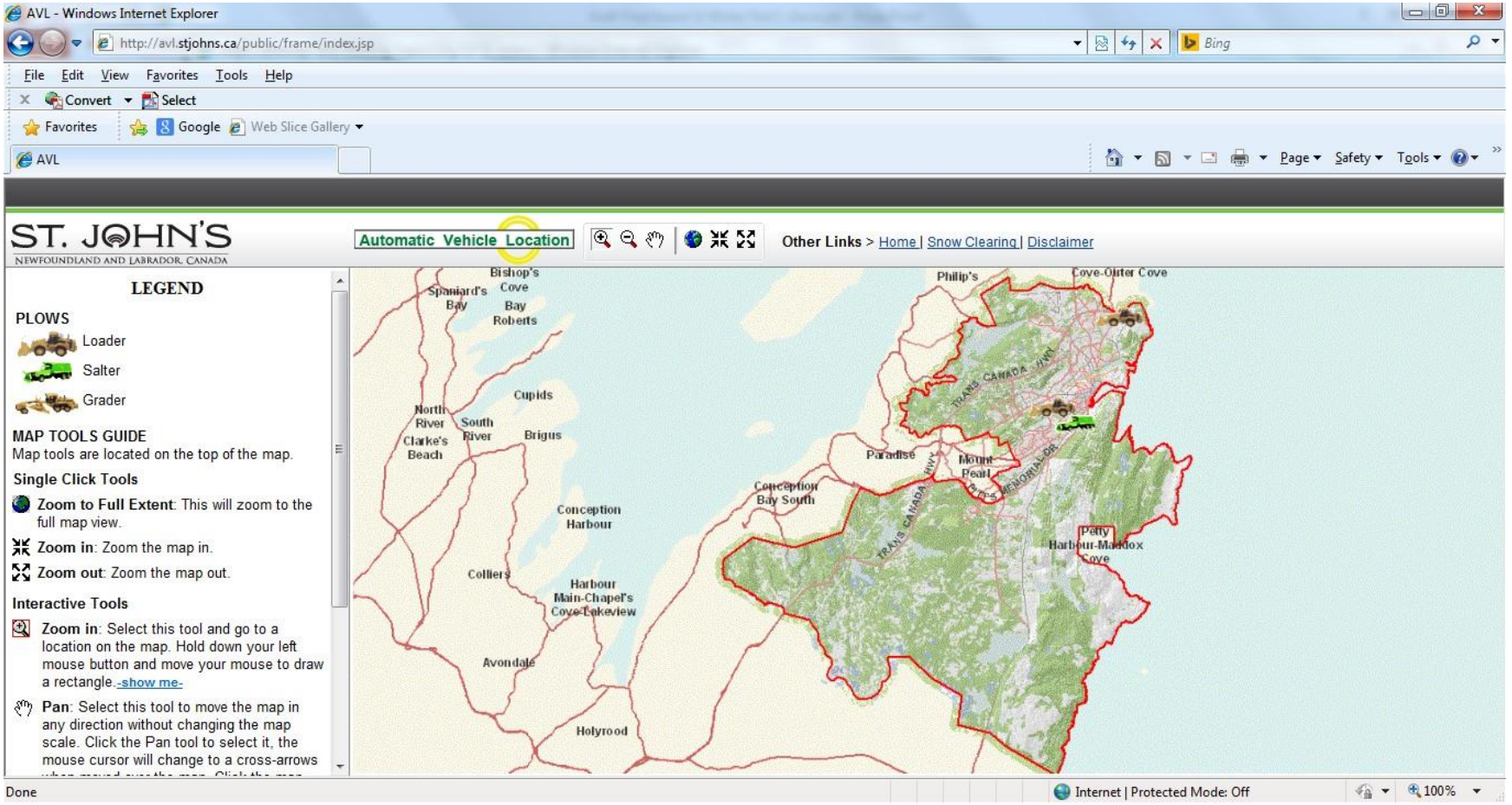
The City makes substantial efforts to communicate with residents. There are three main purposes – gaining the cooperation of residents, particularly in getting cars out of the way of operations, gaining information from residents about what needs to still be done, and informing residents so they understand what is being done and the limitations.

The City uses many means of outgoing communications. The Director of Public Works and Parks and members of Council brief the media. The City web site lists information on planned snow removal and actually shows where its vehicles are working at any time. The City uses social media and subscription emails to send targeted messages, and it uses old fashioned signs on the street and barricades to give very specific messages, generally about snow removal plans.

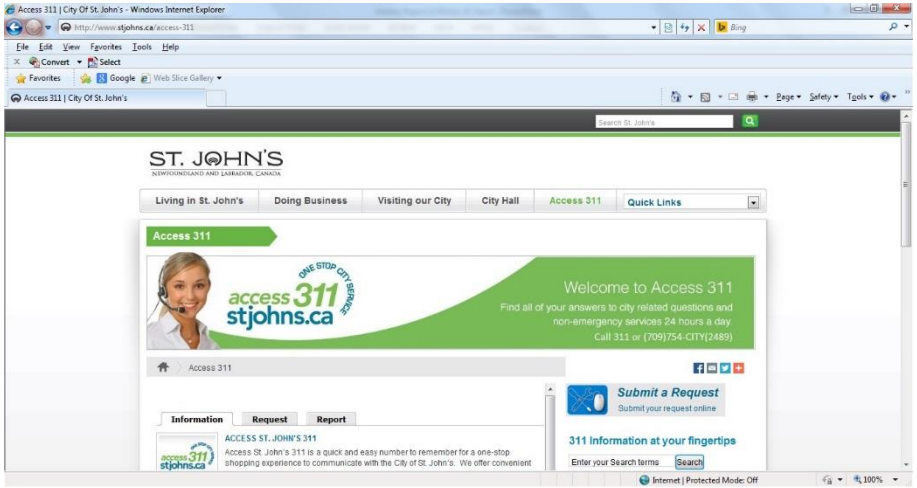
External Communications

Automatic Vehicle Location

The AVL data feeds a website giving residents information on winter maintenance activities, as well as providing data for supervising operations and reviewing incidents.



External Communications



Incoming communications are generally funneled through the 311 group and tend to be by telephone or email. 311 treads a careful balance between satisfying customer requests (ideally making something happen and perhaps reporting back to them that it has occurred), and minimizing impact on operations (better that forepersons and managers are dealing with the snow rather than pursuing complaints about activities that are underway but not yet completed). We Heard reports 311 may now fall too far on the “minimizing impact” side, not taking client requests, even repeated client requests seriously and not passing even useful information on to the Roads Department. Agencies such as Metrobus, the Post Office and the School District found this particularly frustrating.

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External Communications

There are a number of steps that can be taken this year:

- Develop a revised protocol for handling 311 calls on snow issues. (QH7) Some elements could include:
  - Ensure adequate responses to snow complaints are established for 311 operators so that they are not perceived as being “dismissive” on the phone. This may include:
    - Take calls, record by address/phone number, identify duplicate/follow-up calls
    - When call is for something that should occur over a time period that hasn’t expired (e.g. plow my sidewalk while still snowing), give and record estimated response time
    - If second call occurs after estimated response time, direct it to Roads for follow-up
    - When call is for something NOT in process/that will NOT necessarily happen anyway, tell caller it is not something the City does (e.g. clear my driveway) or send it to the department to be done (e.g. sight lines need to be restored at an intersection). If snow event underway, indicate it may take some time to get to it.
    - Make department aware of streets or issues with multiple calls, or other unusual circumstances
    - Any snow calls more than 12 hours after snow stops falling to be forwarded to the Department

External Communications

There is another step that can be taken this year:

- Establish a communication protocol and process for key stakeholders, such as the Eastern School District and Metrobus to communicate with designated, informed individuals in Roads on matters related to service suspension or interruption (not specific snow or road issues, which would stay with 311) (QH5)
  - Have Metrobus (Dispatch Supervisor) take and process all complaints from operators. Routine concerns (slippery street) should be conveyed through 311, but the Supervisor at Metrobus should have ability to contact Roads for severe situations

Other areas for possible improvement that will be reviewed further for the Final Report:

- Involve the City's improved Communications capability in getting out the "snow story"
  - Maintain a management media "voice" on the snow issue, and prepare a "succession plan" recognizing a change will be required and that the voice needs knowledge and credibility on snow issues
  - Ensure a quicker response to identify and explain the real story when controversy arises
  - Provide better and regular event status information to the press, and to Councillors and senior management to improve consistency, accuracy of public messages
- Two specific approaches might help improve communication of snow removal information:
  - Upgrade the subscription email service to provide notices targeted at particular streets/blocks – for snow removal, parking bans, etc.
  - Collect email / text message # /phone number with every on-street parking permit and send notices of pending snow removals by email, text message or automated phone call as the resident prefers

Facility Requirements

The City has one major depot that supports its road maintenance activities, as well as those of other public works functions. There is a much smaller Roads Depot at the Goulds, but it has no fueling facility and no salt storage, so vehicles based there can do one run when an event starts but are back to the downtown depot before the shift is over.

Having most operations centralized is an advantage from a management point of view, and the co-location with Fleet Services is essential. But the growth of Southlands and Galway over time will both increase the amount of roads to be maintained (the amount of equipment required) and result in more and more City roads being distant from the depot.

Facility Requirements

There are a number of steps that can be taken this year:

- Keep the sidewalk plow storage indoors at the former Metrobus location, and require Fleet to store repaired sidewalk plows indoors until they can be collected by Roads (QH2)

Other areas for possible improvement that will be reviewed further for the Final Report:

- Some form of shelter, ideally heated indoor space, be created/identified for the blower attachments
- Develop requirements for a new depot in the Southlands/Galway area, to accommodate Road operations, a Fleet Services presence, fuel supply. salt and sand storage, and likely requirements for other groups within the City
- Identify short term options to enhance operations in the east, such as access to private or other government fueling facilities and salt storage

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Quick Hits

Actions for 2014-15 Winter

Quick Hits

The most significant issues in St. John's relate to poor sidewalk clearing. The major causes of the problem are:

- poor equipment availability (down requiring repairs),
- inadequate snow removal, leaving too much snow on the sidewalks for the sidewalk equipment to handle, and
- Sidewalk policies and practices, particularly the fact sidewalk plowing generally does not start until one shift after the snow stops (12 to 24 hours after), and sidewalk plowing is the least favoured assignment for skilled operators.

Some of the changes required to resolve these issues will take some time, and will not be achieved for the 2014 winter. However we have identified some Quick Hits for implementation in 2014 that focus on these problem areas. More snow removal will help with traffic movement, but it is essential to improving sidewalks. Sidewalks can't be plowed, or snow removed, if there is no equipment available. Thus our Quick Hits suggest investment in these areas because they are the best way to improve sidewalks, and they tend to improve roads as well.

There are also opportunities to reduce the cost of plowing and salting on residential streets that can help with snow removal staffing – and reduce how often driveways need to be shoveled.

QH1) Improve Snow Removal and Sidewalk Clearing Standards

It is recommended that service standards be changed as follows:

- Salt sidewalks before snowfalls when they won't be plowed for some time.
- Start sidewalk plowing as soon as snow accumulations begin
- Begin snow removal operations as soon as the snowfall stops, and conduct snow removal when required to keep sidewalks open
- Conduct snow removal on Duckworth, Water and George Streets after every storm of 10 cms or more in the downtown area, or an equivalent accumulation from smaller events
- Spread salt on George Street before snow events
- Use hired trucks to facilitate snow removal earlier in the process, while City trucks are still required for plowing and salting.
- Complete snow removal operations that are underway when snowfall begins

Implications:

- The major cost will be the use of hired trucks for earlier snow removal. There may be some off-setting saving in terms of reduced overtime between snow events – depending upon the frequency of snow events. Assuming 20 trucks are called out for 40 shifts, the cost would be $800,000, although the actual cost will be influenced by weather conditions.
- It would also be necessary to assign some City staff to the snow removal crews starting when the snowfall stops. They would be operating the snowblower, sidewalk plows, loaders, manning the wharf and acting as spotters. This could increase costs up to $250,000 unless QH2 is also adopted.

QH2) Reduced Driveway Shoveling

It is recommended that service levels on residential streets be adjusted as follows:

- On level residential streets (including cul-de-sacs), aim to establish passable snow packed conditions:
  - Salting on residential streets will be limited to intersections and slippery sections
  - Minimize the number of plow runs on residential streets, ideally only two in each direction (the “first cut” and a “push back”), with additional push back only where residents push snow onto the street
- On residential streets (including cul-de-sacs) with significant slopes, achieve bare pavement, using salt as required
- Divert resources from the “push back” phase to support earlier snow removal operations. This will have some challenges this winter, before routes are redesigned, which may delay some snow removal or extend the response in some areas, although plowing would still be completed within 24 hours.

Implications:

- Residential roads will be snow packed. Residents will have to shovel their driveways less frequently. Push back may take a little longer to be completed
- This will provide the City staff necessary to operate the snowblowers, sidewalk plows, loaders, to man the wharf and act as spotters for earlier snow removal operations. This would save the $250,000 that would otherwise be required to accommodate earlier snow removal

QH3) Sidewalk Crew Pilot

It is recommended that a separate daytime sidewalk crew be established for this winter as a Pilot Project

- A foreperson be appointed with prime responsibility for sidewalk operations and snow removal planning, with the responsibility to assist with other work when not required
- A day shift of 8 sidewalk equipment operators be dedicated to carrying out sidewalk plowing, blowing and related snow removal activities as long as those activities are required, and assigned to other tasks when these activities are not required. There are two options for staffing this crew:
  1. Take two staff from each current shift, plus 2 additional operators (consistent with QH2)
  2. Increase staffing by 8 to leave all resources on existing shifts in place (retains current staffing for plowing and pushback)
- That the sidewalk crew operate from the old Metrobus garage where sidewalk machines are stored indoors. The project to accommodate the farmers market may need to include some physical changes to isolate the uses.
- That Fleet Services store repaired sidewalk plows indoors after repairs until they are picked up

QH3) Sidewalk Crew Pilot

QH3 Implications:

- A dedicated day shift should attract experienced, capable operators. There will still be four (or 6) sidewalk plow operators on each shift to accommodate plowing or salting requirements at other times
- The dedicated team will be accountable for sidewalk conditions
- Sidewalks will be plowed earlier, and before wet snowfalls turn to ice
- There will be an incremental cost to add the foreperson ($40,000) and two operators ($46,000) – or eight operators ($184,000) if the all new staffing is selected.

QH4) Improve Communications between Roads, Fleet, and Supply

It is recommended that processes be changed to reduce equipment damage and improve the repair process:

- Have operators report equipment problems directly to the Fleet foreperson or their designate (while also advising the Roads foreperson). Fleet is to ensure someone is available throughout the shift, including at break times.
- Provide faster feedback to operators on preventable damage occurrences, not as a disciplinary practice but as educational (this does not replace the formal investigation process for accidents)
- Establish a process to have Fleet and Roads formally review failures and repair delays every two weeks to identify issues. The result could be changes in operating practices and/or inventory levels required and/or notice/directive/training for equipment users
- Improve training, of operators and forepersons aimed at reducing equipment damage, improving operator familiarity and skill with equipment for snow operations

Implications:

- Costs associated with improved training are included under QH6
- Should result in reduced equipment downtime and maintenance costs

QH5) Longer Winter Season

It is recommended that full winter staffing be put in place for 16 weeks per year, with some staffing in place for 18 weeks:

- Year-round staff to be transferred from other departments generally be transferred for a 16 week period, and transferred earlier in the fall or later in the spring when weather requires
- Seasonal operators, all new operators and all seasonal forepersons be called in for the 18 week period.

- The extra week early in the season be used for training, and to respond to any early snow or freezing rain

Implications:

- Assuming 60 operators and forepersons come in for the extra two weeks, cost would be approximately $200,000
- The approach should result in better response to early events and allow for improved training, resulting in less equipment damage, which may be reflected in lower Fleet overtime or outsourcing costs

QH6) Training

It is recommended that more operator and foreperson training be conducted

- Key elements of the enhanced training will include:
  - Add one trainer to each shift
  - Trainers will report to the Training Coordinator and assist with:
    - Signing off employees on various types of equipment
    - Conducting classroom training of operators, particularly new operators, early in the winter season
    - Conducting one-on-one (shotgun or shadowing) training of individual operators through the winter
    - Working with Fleet to identify behaviours that will reduce equipment maintenance requirements, and working with operators to implement changes required
    - Finding or preparing training materials (e.g. curriculum, materials, films, etc.)
  - Foreperson training would focus on policies, processes, issues and people management skills required, and will be facilitated by the Training Coordinator, working with management

Implications:

- Three trainers will cost approximately $120,000 for the winter

QH7) External Communications

It is recommended that the following changes be implemented immediately

- Develop a revised protocol for handling 311 calls on snow issues.
- Establish a communication protocol and process for key stakeholders, such as the Eastern School District and Metrobus to communicate with designated, informed individuals in Roads on matters related to service suspension or interruption (not specific snow or road issues, which would stay with 311)

Implications:

- No costs will result.

QH8) Other Recommendations for This Winter

The following items can be implemented immediately

a. Fleet to contract out some annual inspections if it is not certain to have capacity to complete them before December 1.

b. Fleet technicians to have at least one location for unfiltered internet access to allow parts searches, manual reviews, etc. Does not have to be on the City network.

c. Conduct counts of sidewalk volumes this fall to contribute to finalizing sidewalk maintenance routes. This would not need to be redone for several years.

d. Make use of the “critical path” optional as a Pilot Project this winter. Operators may take an alternative route, subject to the directions of the foreperson, as long as they cover all streets, and do the work generally consistent with the priority ratings.

e. Implement the winter parking ban this winter the first time there is a snowfall of 10 cms or more. Announce the now policy around December 1, and declare the parking ban when the first major snowfall occurs, advising the public through the press, the website and social media. Begin enforcement 24 hours later.

   – As an alternative, the ban could be established December 1st with more notice being provided, however that could result in the ban taking effect when there is no evident reason for it.

f. Exempt home case workers from the parking ban

QH8) Other Recommendations for This Winter

QH 8 Implications:

- Anticipated costs of these recommendations are as follows:
  a) depend upon extent required,
  b) could be $1,000 to $2,000, with the potential for off-setting savings,
  c) $60,000 should be adequate,
  d) there will be no cost, but some residents may notice inconsistent approaches between operators on different shifts making response to enquiries more difficult
  e) there is a potential saving, depending upon weather conditions. In the event of significant snow events in December, street and sidewalk conditions will also be improved

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