



# Public Works Service Level Review Winter Maintenance

May 2023



Transportation and Fleet  
Management

# Agenda

**1** Background

**2** Road Operations

**3** Safety and Risk Assessment

**4**

**Severe Weather Response Plan**

**5**

**Winterization Reserve**

**6**

**Recommendations**





# Background



# Why Service Level Reviews Matter



- **Responsive to the needs of the community** – services meet and are adaptive to community needs and expectations
- **Efficient** – service processes are optimized and right-sized (using resources - people, materials, equipment, infrastructure, buildings - the best way possible)
- **Effective** – services are delivered with better quality and possibly in new ways
- **Making evidence-informed decisions** – using data and process performance indicators to evaluate service delivery efficacy



# Why This Service Level Review Matters



Key Activity in the Term of Council Service Excellence Strategic Plan



Audit of Winter Maintenance (2018)



Planning for Growth





# Winter Maintenance in Vaughan



Approximately  
**90,000**  
windrows



More than  
**2,200 lane km**  
of roads

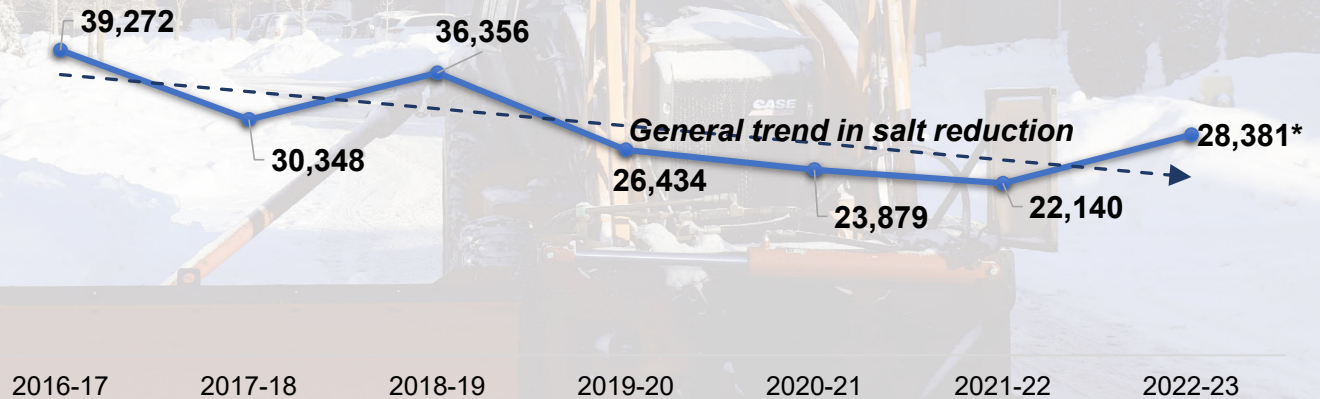


More than  
**1,200 km**  
of sidewalks



More than  
**130** crosswalk  
locations

## Salt Usage by Season (in tonnes) – Roads



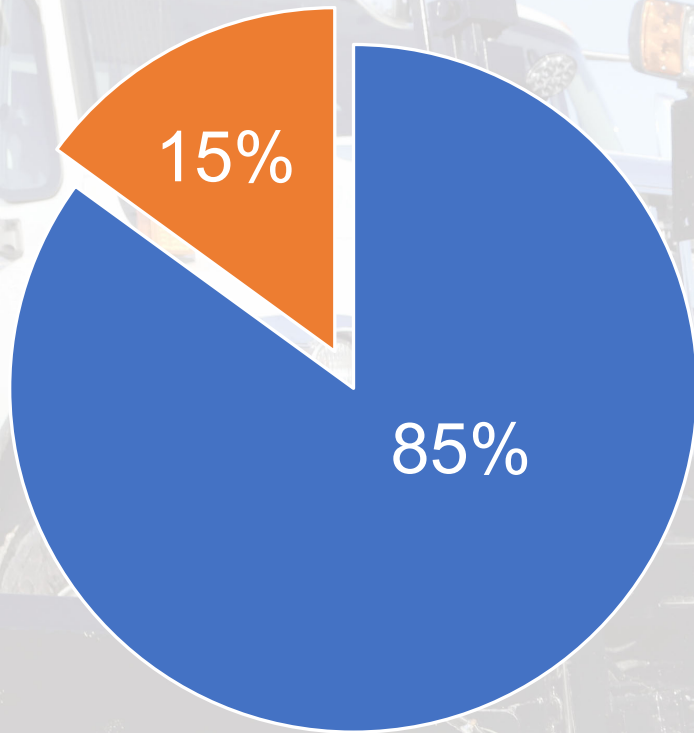
\*While having less events in the 2022-23 season, it had an increase in freezing rain events as well as multi-day events resulting in an increase in salt usage due to the application of salt numerous times during one event.



# A Winter Season in Vaughan



% OF PLOWING EVENTS



- Average # of Winter Events (46)
- Average # of Plowing Events (7)



Winter Operations Events by Type by Season

Table 1: Winter Operations Event History by Season

Season	Salting	Plowing & Salting	Total
2016-17	39	6	45
2017-18	32	10	42
2018-19	50	9	59
2019-20	46	6	52
2020-21	29	9	38
2021-22	45	4	49
2022-23	30	6	36

# 2022 Citizen and Business Survey



- Areas to be protected and maintained included winter maintenance services
- **Road snow removal** was identified as a primary area for maintenance

Overall, there is an **increase** in winter maintenance areas:

- Road snow removal increased **5 points**
- End-of-driveway snow removal increased **1 point**



# Key Terminology

## BARE PAVEMENT

- Denotes fully cleared snow from a driving surface.



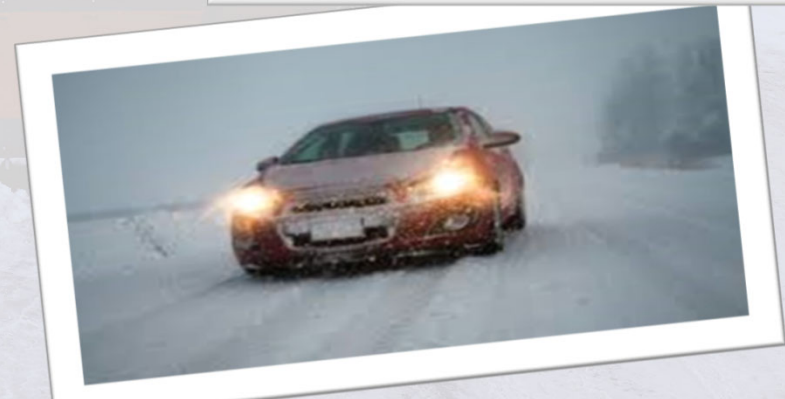
## SAFE AND PASSABLE

- A road surface that is free from as much ice and snow as is practical and may be traveled safely at reasonable speed.



## SNOW PACK

- Snow pack is hard-packed snow on a roadway.








# Jurisdictional Review



Service Level	 BRAMPTON	 MARKHAM	 VAUGHAN	 Richmond Hill	 TORONTO
Mains					
Residential					
Windrow		 *persons with disabilities and elderly residents only	 *all residential driveways, within 4 hours after plow	 *all residential driveways, up to 13 hours after snowfall	 *clear all residential driveways, where mechanically possible

Legend:	 = Bare Pavement	 = Safe & Passable	 = Snow Pack
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# Road Operations

## Service Level Options



1. STATUS QUO

2. INTERMEDIATE

3. MINIMUM MAINTENANCE  
STANDARDS (MMS)

# Option 1: Status Quo

## Roads Operations



### **SERVICE LEVEL**

- Mains and Residential maintained to bare pavement
- Plowing operations: 5 cm threshold

### **Timeline:**

- 4 hours for Mains
- 12 hours for Residential

### **COST**

- Total cost is \$9.7M

*Vaughan is the only municipality with this high level of service.*



# Service Level Options



1

## STATUS QUO

### SERVICE LEVEL

Mains: bare pavement  
Residentials: bare pavement

Plowing Mains: 5 cm  
Plowing Residentials: 5 cm

### TIMELINES

Mains: 4 hours  
Residentials: 12 hours

**COST: \$9.7M**

2

## INTERMEDIATE

### SERVICE LEVEL

Mains: bare pavement  
Residentials: safe & passable

Plowing Mains: 5 cm  
Plowing Residentials: 8 cm

### TIMELINES

Mains: 4 hours  
Residentials: 12 hours

**COST: \$9.2M**

3

## MMS

### SERVICE LEVEL

Mains: safe & passable  
Residentials: safe & passable

Plowing Mains: 5-8 cm  
Plowing Residentials: 8-10 cm

### TIMELINES

Mains: 6-12 hours  
Residentials: 16-24 hours

**COST: \$8.4M**

# Safety and Risk Assessment



- True North Safety Group (TNS) performed an analysis on winter collisions in Vaughan compared to surrounding municipalities
- Collisions increased during winter events for all four municipalities with the smallest percentage increase associated with Vaughan
- Findings showed that the impact of Vaughan's winter maintenance activities on winter event collisions is statistically significant
- Contributing to 13% fewer collisions in comparison to the surrounding municipalities





# Windrows

## Service Level Options



1. STATUS QUO

2. PLOW-WINDROW COUPLING:  
MAINTAINING STATUS QUO  
TIMELINES



# Option 1: Status Quo

## Windrows



### SERVICE LEVEL

- Windrow clearing is performed during plowing operations
- Windrow unit follows the plow (performed within 4 hours of the pass of the plow)

### Timeline:

- Mains cleared within 8 hours
- Residentials cleared within 16 hours

### COST

- \$2.1M

### IMPACT

- Up to four-hour delay for windrow clearing

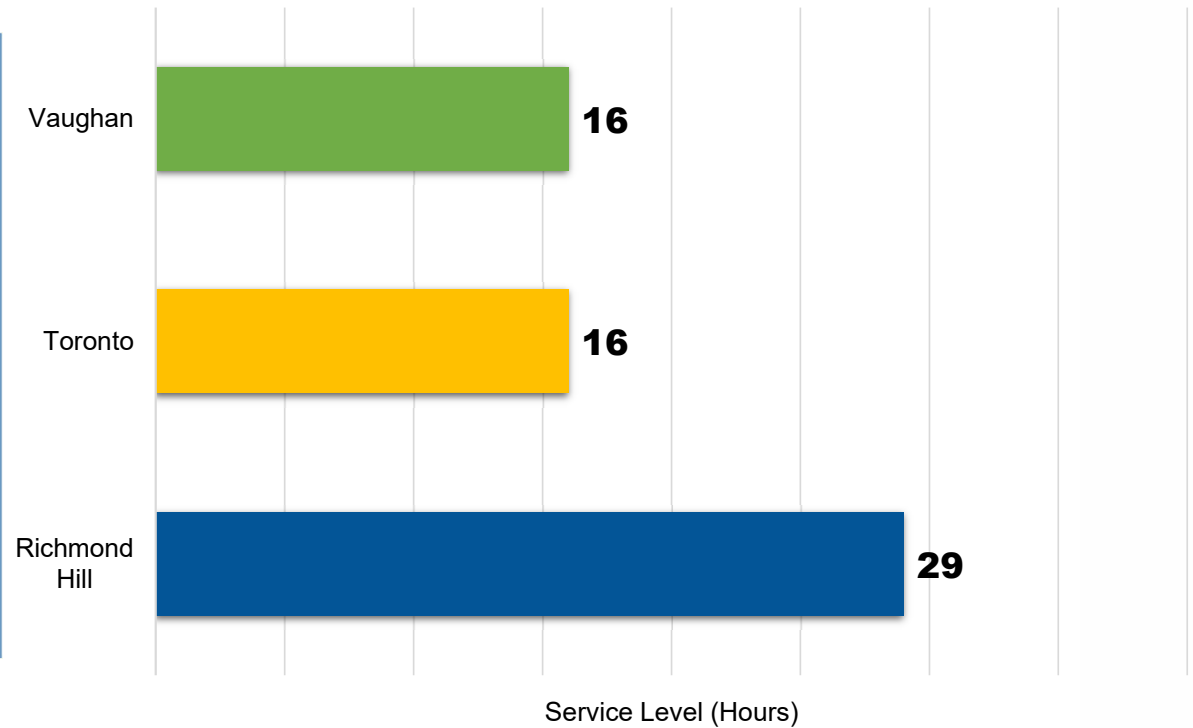


# Windrow Clearing Comparison



- Vaughan begins plowing and windrow operations at 5cm
- Toronto begins plowing operations at 8cm and windrows begin at 25cm
  - \*Service is *only* offered where there is no on-street parking, roads are wide, and there are no other obstructions\*
- Richmond Hill begins plowing windrow operations at 10cm

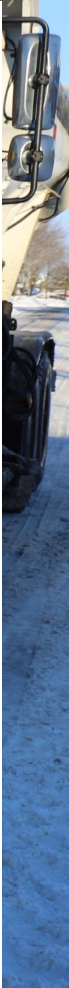
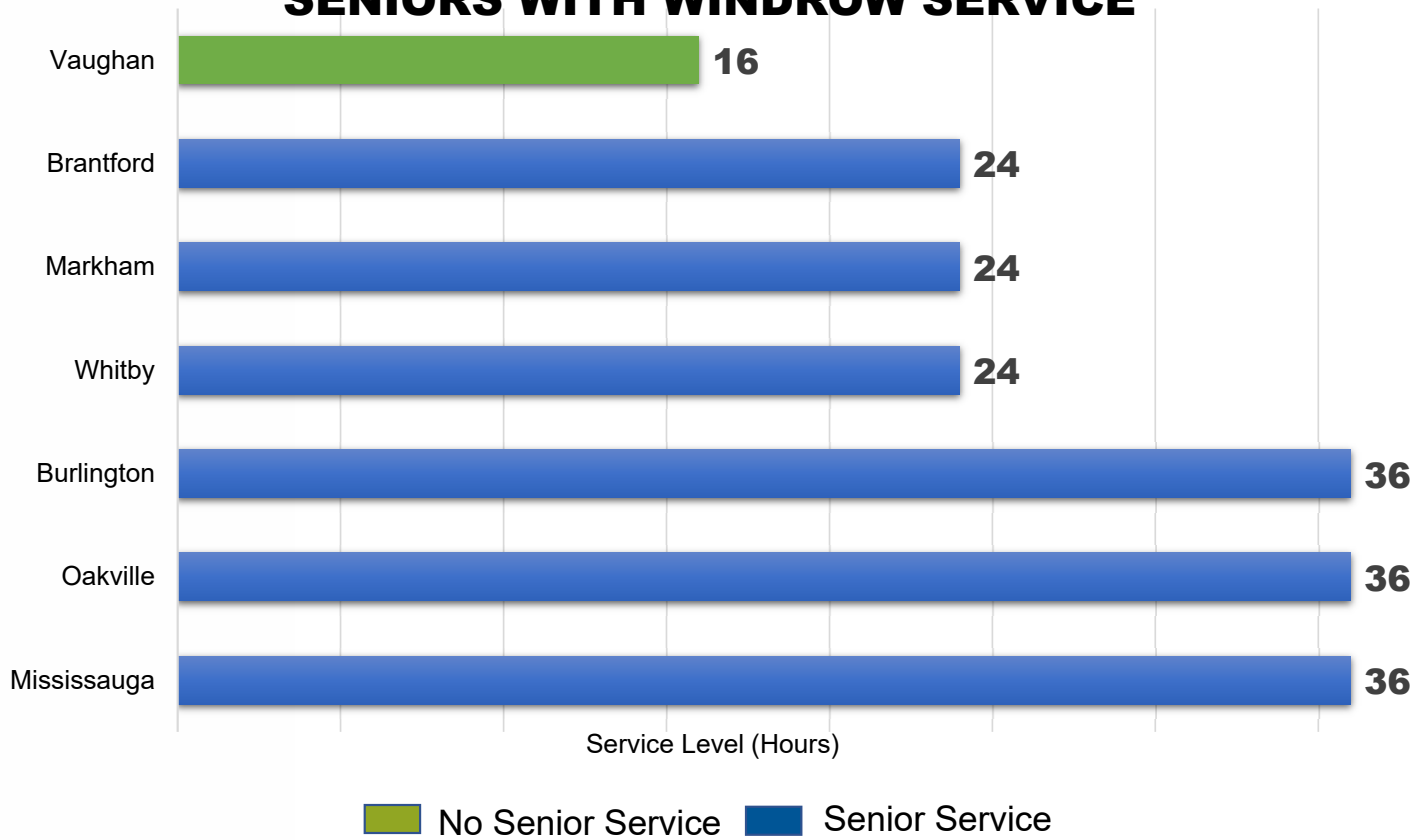
## WINDROW CLEARING SERVICE



# Windrow Programs Across the GTA



## MUNICIPALITIES WHO PROVIDE SENIORS WITH WINDROW SERVICE



# Service Level Options



1

## STATUS QUO

### SERVICE LEVEL

- Windrow clearing is performed during plowing operations
- Windrow unit follows the plow (performed within 4 hours of the pass of the plow)

**COST: \$2.1M**

2

## PLOW-WINDROW COUPLING: MAINTAIN STATUS QUO

### SERVICE LEVEL

- Windrow clearing is performed during plowing operations
- Windrow unit is coupled with plow so that driveways are cleared as close to the pass of the plow as possible

**COST: \$4.1 - 5M\***

\*Pricing quoted 7 years ago; does not include COVID pricing



# Snow Removal Service Level Options



1. STATUS QUO

2. SNOW STORAGE  
CAPACITY ISSUES:  
LANEWAYS, NARROW STREETS  
AND CUL-DE-SACS

# Option 1: Status Quo

## Snow Removal



### CURRENT SERVICES PROVIDED

- In Woodbridge and Kleinberg BIAs: Snow removal when snow piles on curbs (0.5 m)
  - **\$30K** per operation, typically 3-4 times per year
- Snow removal in laneways and narrow streets is done after severe storms as required
  - **\$330K** per operation, typically one time per year

### IMPACT

- Negative feedback from residents in laneways and narrow streets due to lack of snow storage



# Snow Removal Service Level Options



## 1 STATUS QUO

### CURRENT SERVICES PROVIDED:

- Woodbridge & Kleinberg BIAs: Snow removal when snow piles on curbs to 0.5m
- Snow removal in laneway and narrow streets done after severe storms as required

### COST:

BIAs → \$120K (~4x/year)  
Laneways and Narrow Streets → \$330K (~1x/year)

**Average season total of \$450K**

## 2

## SNOW STORAGE CAPACITY ISSUES:

### LANEWAYS, NARROW STREETS & CUL-DE-SACS

### SERVICE LEVEL:

In addition to current services provided:

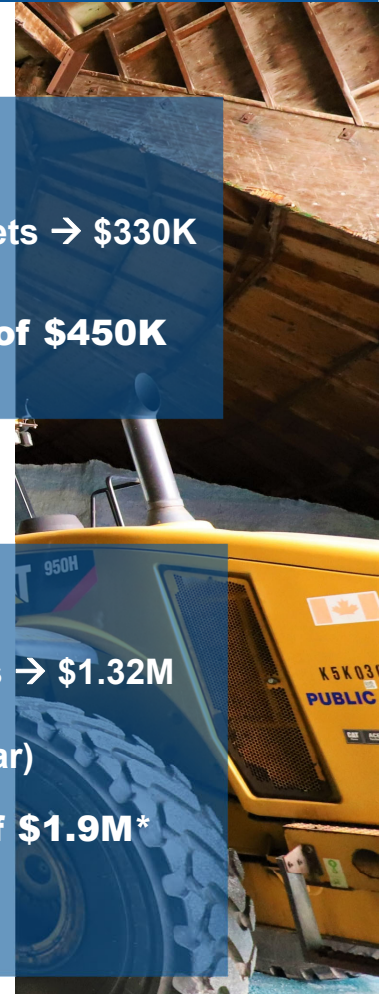
- Snow removal services on laneways and narrow streets\*
- Snow removal services on cul-de-sacs

### COST:

BIAs → \$120K (~4x/year)  
Laneways and Narrow Streets → \$1.32M (~4x/year)  
Cul-de-sacs → \$456K (~1x/year)

**Average season total of \$1.9M\***

*\*Note: This type of snow removal is already done for severe storm types 3 and 4*



# Severe Weather Response Plan



Clearly defines service delivery and sets expectations



Provides flexibility to operating departments during larger events



Reduced calls once this is established (to Mayor and Members of Council)



Other municipalities assess service levels based on severity of storm; Toronto is the only municipality with this plan





# Severe Weather Response Plan

## Primary Roads



### Treatment Condition:

- ✓ Roadway: Bare Pavement
- ✓ Windrow: One Car Width
- ✓ Start Plowing: 5 cm

	Time to Complete (hours)			
	Storm Type 1 0-5 cm	Storm Type 2 5-20 cm	Storm Type 3 20-35 cm	Storm Type 4 35+ cm
Roadway (after snowfall)	4	4	6	8
Windrow (after plow)		4	8	12





# Severe Weather Response Plan

## Secondary Roads & Laneways



### Treatment Condition:

- ✓ Roadway: Bare Pavement
- ✓ Windrow: One Car Width
- ✓ Laneways (narrow streets): Bare Pavement
  - \*Snow removal on laneways and narrow streets will be performed for Storm Types 3 and 4
- ✓ Start Plowing: 5 cm



	Time to Complete (hours)			
	Storm Type 1 0-5 cm	Storm Type 2 5-20 cm	Storm Type 3 20-35 cm	Storm Type 4 35+ cm
Roadway (after snowfall)	12	12	16	20
Windrow (after plow)		4	8	12
Laneway (after snowfall)	12	12	16	20

# Communications Plan



This past winter season, more than 125 winter communications were done using the following tactics:

- Public Service Announcements and Council Communications Packages
- Educational videos on City services
- Proactive media outreach
- eNewsletters
- Brochures
- Social media (both organic and paid) to the City's 70,000 followers
- Mobile signs
- Website content, mailers, signage and much more.



# Summary of Options & Recommendations



## ROADS

**OPTION 1:**  
Status Quo

Cost: \$9.7M



**OPTION 2:**  
Intermediate  
Cost: \$9.2M

**OPTION 3:**  
MMS  
Cost: \$8.4M

## WINDROWS

**OPTION 1:**  
Status Quo

Cost: \$2.1M



**OPTION 2:**  
Plow-Windrow Coupling  
Cost: \$4.1M - \$5M\*  
\*estimated

## SNOW REMOVAL

**OPTION 1:**  
Status Quo

Cost: \$450K

\*Current Budget: \$200K



**OPTION 2:**  
Snow storage  
capacity issues  
Cost: \$1.9M



# Winterization Reserve

## Background and Strategy





# Background



## **2018 Audit Report Recommendation:**

Complete a review of winter maintenance strategies and budgets to ensure alignment with Council directives and historical and anticipated spending

## **PURPOSE OF WINTERIZATION RESERVE**

- To offset significant unfavorable budget variances due to severe winter conditions
- To be used to offset unforeseen year-end Winter Control Divisions variances due to severe weather conditions which put the City in an overall unfavorable position



# Winterization Reserve



## CURRENT RESERVE

- \$5.5M

## WINTER RESERVE STRATEGY

- Net annual surplus funds generated within the Public Works Winter Control Division or City-wide. Contributions will occur as required
- Recommended Target: A maximum of 40% of the four-year Winter Maintenance annual adjusted average costs
- Under authorization of the DCM, Corporate Services/CFO, funds may also be used to phase-in unexpected expense pressures (i.e. contract negotiations, etc.)





**Conclusion**

**Recommendations**



# Conclusions and Recommendations



- Vaughan currently has a comprehensive winter program that has among the highest levels of service for winter maintenance in the GTA. This contributes to 13% less collisions
- Based on this analysis, it is recommended to maintain current service levels.
- Public Works recommends \$250K in funding to sustain current snow removal operations without impacting the winter reserve.
- To increase citizen satisfaction in extreme weather events, it is recommended that the City proceed with the proposed Severe Weather Response plan.



**Thank You**