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COMMUNICATION
FAA - June 6/2018
ITEM - 4.4

Winter Maintenance Audit

FA&A Committee – Wednesday June 6, 2018

VAUGHAN

Today's Presentation

- Audit Objective, Scope and Methodology
- Audit Conclusion
- Audit Observations
- Management Action Plans
- Next Steps
- Questions

Audit Objective

- To evaluate the adequacy and effectiveness of the internal controls, processes and procedures in place to mitigate the business risks associated with the execution of the City's winter maintenance strategy and programs.

Audit Scope & Methodology

- Review of existing policies and procedures
- Review of the procurement process for awarding the winter road maintenance services agreement
- Staff interviews
- Sampling of work orders and 3rd party service agreements
- Review included the first 1.5 years under the new agreement (January 2016 – December 2017)

Not in Scope: →Parking lot & Sidewalk Clearing Program

Audit Conclusion

- Improvements are required to ensure risks related to the execution of the City's winter maintenance strategy are efficiently and effectively mitigated.

- No issues were noted in our review of the procurement process for awarding the winter road maintenance services agreement.

Issues and Observations

1. Conduct a risk based evaluation of the City's winter maintenance strategy and programs.
2. Ensure winter maintenance budgets are reflective of historical and anticipated spend.
3. Enhance the inspection process to verify the quality and completeness of contractor work.
4. Improve monitoring and oversight activities over several processes including material inventory and usage, contract administration, work order administration, and record retention.

#1 – Issues & Observations - Road Classes

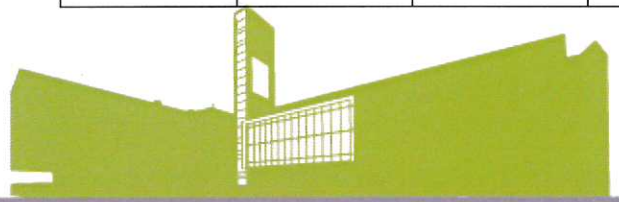
- Ontario Regulation 239/02 sets out the Minimum Maintenance Standards for road classes 1 to 5.
- Road classification is based on the applicable speed limit and the average annual daily traffic.
- The City of Vaughan is not responsible for any Class 1 roads.
- Class 6 signifies laneways, which represents 16 lane kilometres in Vaughan. There are currently no Minimum Maintenance Standards as it relates to class 6 roads.

#1 – Road Classes – City of Vaughan

Class	Kilometres	Examples
2	26	Centre Street, Clark Avenue West (partial), Martin Grove Road (partial), Woodbridge Avenue (partial)
3	201	York Hill Boulevard (partial), Creditstone Road, Melville Avenue (partial), Chancellor Drive, Willis Road
4	867	Avro Road (partial), Westmount Boulevard, Doughton Road, Zenway Boulevard (partial), Blue Willow Drive
5	974	Charles Street, Railway Street, Ontario Street, Cartwright Boulevard, North Field Court
6	16	Cousin's Lane, Bute Court, Green Avenue, Belsite Court

#1 – Strategy Comparison

Level of Service Commitment: Pavement Condition									
Class[1]	Snow Depth (cm)	Minimum Maintenance Standards	Vaughan Lane Kms	Vaughan	Toronto	Richmond Hill	Markham	Brampton	Newmarket
2	5	Min (3m, lane width)	26	**Bare**	Bare	N/A	Bare	Bare	N/A
3	8	Min (3m, lane width)	201	**Bare**	Centre bare	Centre bare	Bare	Bare	Safe and Passable
4	8	5m total	867	**Bare**	Safe and Passable	Safe and Passable	Safe and Passable	Safe and Passable	Safe and Passable
5	10	5m total	974	**Bare**	Safe and Passable	Safe and Passable	Safe and Passable	Safe and Passable	Safe and Passable
6	NA	No standard	16	**Clear**	No Standard	No Standard	No Standard	No Standard	No Standard



#1 – Class 5 Road, Richmond Hill (After Ploughing – Safe & Passable)

#1 – Class 5 Road, Vaughan (After – Bare)

VAUGHAN

#1 – Class 5 Road, Side By Side Comparison

(Richmond Hill on the Left, Vaughan on the Right)

#1 – De-icer Comparison (2016)

Municipality	De-Icing Agent	2016 (Tons)	Lane Kms	Tons/Lane Km
Vaughan	Thawrox	45,000	2,084	22
Toronto	Salt	88,140	14,800	6
Richmond Hill	Salt, Thawrox	9,000	1,432	6
Markham	Salt	29,000	2,189	13

#1 – Financial Implications

- The 2016 budget of $2.1M represents 23,000 tons of salt purchases.
- The City's historical average usage over the past ten years has been 34,000 tons.
- The City's winter maintenance reserves have been depleted.

#1 – Environmental Implications

- A five-year study on the effect of road salt conducted by Environment Canada concluded in 2012 that "road salts pose a risk to plants, animals and the aquatic environment." The salt is damaging the ecosystem, beginning to infiltrate ground water supply and has the potential to kill sensitive species.

- Salinity is measured by tracking the chloride level of water. On Jan. 8 2018, soon after four centimetres of snow fell in Mississauga, the chloride level of the Cooksville Creek was 18,000 mg/litre. The average chloride level in oceans is 20,000 mg/liter.

#1 – Environmental Implications

- In 2015, the U.S. National Highway Traffic Safety Administration pegged salt corrosion as the culprit in thousands of vehicle brake failures.

- Salt brine seeping into concrete dramatically speeds up the corrosion of rebar within — and is heavily responsible for the poor state of bridges and highway overpasses across central Canada.

- Dalhousie University estimated that it costs it an extra $15,000 in cleaning and maintenance each year just to repair all the damage salt does to floors and baseboards.

#1 – Recommendation

- Currently, the City does not have any performance measures in place to determine whether our existing winter maintenance strategies and levels of service are deriving any significant benefits given the incremental cost and potentially adverse environmental impact.

- A risk based evaluation would help develop criteria that would evaluate the risks to achieving several of the City's winter maintenance objectives.

Management Action Plans

1. Conduct a risk based evaluation of the City's winter maintenance strategy and programs.

   → Management will conduct a study to evaluate current service levels and overall winter maintenance strategy and programs.

   → Management will study the use of a Maintenance Decision Support System (MDSS) which will aid in optimizing winter maintenance decisions.

Management Action Plans

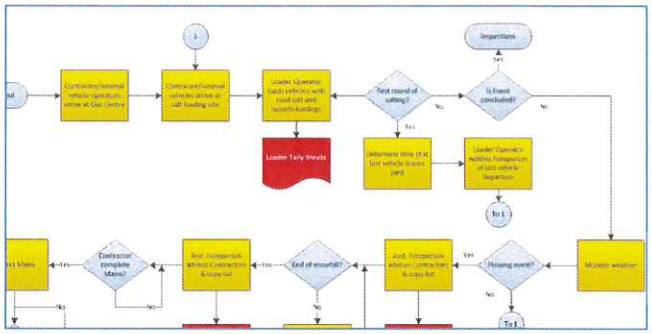
2. Ensure winter maintenance budgets are reflective of historical and anticipated spend.

→ Future budget submissions will be proposed based on historical weather trends and service levels defined in the approved winter maintenance strategy.

→ Budget submissions will also aim to reestablish the winter reserve.

Management Action Plans

3. Enhance the inspection process to verify the quality and completeness of contractor work.



→ Management implemented enhanced procedures during the 2017-18 winter season, including consistent, secure inspection processes

→ Management to include a risk-based inspection sampling approach

Management Action Plans

4. Improve monitoring and oversight activities over several processes including material inventory and usage, contract administration, work order administration, and record retention.

→ Management has already instituted a number improvements to contract administration, material inventory and record retention.

→ Management to reflect these changes by creating the following SOPs:

- Inspection Protocol
- Document Management
- Contract Mobilization
- Financial Management
- Winter Event Management

Next Steps

- Action plans have been developed.
- Implementation is underway.
- Internal Audit will follow up and report on the status of these action plans.

Questions?