



Ontario

Ministry of Municipal Affairs & Housing



Association of Municipalities of Ontario

ONTARIO CENTRE FOR MUNICIPAL BEST PRACTICES

393 University Ave., Suite 1701, Toronto, Ontario M5G 1E6

BEST PRACTICE SUMMARY REPORT

RO – WC – 04 - 02

Roads – Winter Control – Benchmarking and measuring of Salt/Sand usage

Practice Identification: Roads Winter Control – Benchmarking and measuring of Salt/Sand usage

Case Study Municipality: Grey County

Key Word: Operational Procedures

Benefits which resulted from adoption of the Practice;

- **Reduced environmental impact, while meeting the desired level of service**
- **Reduced winter control material costs, while meeting the desired level of service**
- **Evidence-based compliance with Council-adopted levels of service (resulting in reduced legal liabilities and appropriate public safety)**
- **Evidence-based compliance with Environment Canada Salt Management regulatory requirements (reduced environmental impact)**

1. Description of the Practice in the Case-study Municipality

Grey County delivers winter control service across a primary road system consisting of more than 1,600 paved lane kilometers. Grey's 2001 winter event plowing/sanding/salting response was reasonably aggressive in terms of service levels – in keeping with a primary road system designed to facilitate timely movement of goods and people. Bare pavement and centre track-bare service levels were maintained.

System-wide plowing/sanding/salting passes were carried out in approximately 5-6 hours, utilizing 25 combined units (64 system “response kilometers” per unit). Grey has traditionally used a direct-delivery model, with only minor service contracting. Grey’s 2001 MPMP winter control unit costs were superior compared to other primary road system operators in a mostly-rural setting.

In order to monitor compliance with its chosen level of service, to control costs, and to limit potential environmental impacts, Grey has benchmarked its internal performance in sanding/salting spread management practices. Making use of calibrated spread vehicles, Grey has compared actual material spread rates across routes, across vehicle units and across staff operators within a given winter season. Grey has also compared spread rate performance for each route and vehicle unit across winter seasons (time series analysis). The actual spread rate performance has been evaluated against industry (MTO) spread rates associated with bare pavement and centre track-bare service levels. Council & staff review sessions have been used to refine/adapt actual performance, in order to reduce spread rate gaps versus the County’s spread rate standards. Comparison against the existing contracted service is also conducted.

Benchmark spread rates used in this exercise were derived from MTO practice, as they applied to secondary highways in Grey before these were transferred to the County. The MTO bare pavement benchmark is as follows:

| Level of Service | Salt-Dry | Sand-Dry | Anti-icing (Salt Brine) | De-icing Salt Brine | De-icing Calcium/Magnesium Chloride |
|------------------|-----------|------------|-------------------------------------|--|---|
| BARE PAVEMENT | 174/kg/km | 607 kgs/km | 60 litres/km minimum down to -12* C | 41.6 litres/tonne salt 16.6 litres/tonne sand | 39.06 litres/tonne salt 15.6 litres/tonne sand |

2. Evaluation of Practice

Efficiency:

Winter control costs are a function of the frequency of winter event responses, the amount and intensity of winter precipitation, and the volume/unit cost of spread material. Grey’s unit costs (winter control expenditures per kilometer) are low despite its relatively high numbers of event responses and its extremely high snow accumulation. Its unit cost performance has been assisted by Grey’s disciplined spread management practices which are supported and refined by spread rate benchmarking and measurement. The benchmarking approach is practical because it is internal in focus (avoiding complex apple to apple issues across counties), and it has been firmly linked to the enforcement of service levels, individual operator behavior, and cost savings targets.

Compliance with Legislation:

Spread rate benchmarking can/should become a key management practice across a consortium of mid and large-scale system operators – thereby supporting and evaluating their new Salt Management Plans and conforming to Environment Canada

requirements/recommendations. In this sense, the upfront financial and technical investment required to implement a municipal Salt Management plan is the same investment (calibration, spread rate measurement) required of a benchmarking process. Benchmarking is simply an extension of the necessary process (and cost) of collecting the Salt Management data, but it adds further value to this investment by generating positive financial, service level and environmental outcomes.

3. Replication of the Practice

Replicating Grey's materials management benchmarking process would require

- 1) the willingness to purchase calibrated spread units or retrofit existing units, and
- 2) management's determination to expend the level of effort and focus needed for tracking spread rates, analyzing deficiencies against standards, and implementing corrective action on an ongoing basis.

Calibration of spread units and GPS route tracking of spread rate performance is certainly achievable using existing technologies and techniques, and will have a cost-benefit for most medium to large-size road systems.

The technical/financial capacity to design and execute proper benchmarking could be planned and executed in a few months. Given Salt Management Plan implementation requirements, it should be promoted on a meaningful scale in time for the next full winter season (2005).

4. Contact

Ms. Sheila McKerroll, Transportation Services, County of Grey, 519-376-7337

NOTE: See RO – WC – 04 – Methodology Report, for a description of the practice identification methodology, using 2001 MPMP data.