



## Clear Roads Survey on Monitoring Stockpiles of Solid Winter Maintenance Materials

Members of the [Clear Roads Winter Maintenance Pooled Fund](#) are interested in learning about best management practices for the monitoring of stockpiles of solid winter maintenance materials. Of particular interest are:

- The practices used for real-time measurement of solid winter maintenance materials as they are loaded onto snowplow trucks or after application.
- The technology used to produce measurements of stockpiles of solid winter maintenance materials that closely approximate actual inventories.
- Other effective stockpile measurement practices that do not use technology.

Please provide information about your real-time and stockpile measurement practices for solid winter maintenance materials by responding to the questions below. You can view [a PDF of the survey](#) if you'd like to review the entire survey before starting to enter your survey responses.

We would appreciate receiving your responses by **Friday, July 8**. We will notify you when the survey findings are published on the Clear Roads website.

If you have any questions, please don't hesitate to contact Chris Kline at [chris.kline@ctcandassociates.com](mailto:chris.kline@ctcandassociates.com) or 608-318-1416.

Thanks very much for your participation.

**\* Please provide your name and contact information. (This information is required.)**

Name

Title

State DOT

Email

Phone number

### Real-Time Measurement

Please describe any real-time measurement tools you're using to monitor material usage when loading and/or after applying solid winter maintenance materials. These could be snowplow truck add-ons (other than readouts from material spreader controls), scales or other equipment installed in winter maintenance facilities.

### **Measuring Stockpiles**

**\* Is your agency using a specific technology or device to measure stockpiles of solid winter maintenance materials?**

- Yes
- No, but we do measure stockpiles without the use of technology
- No, we do not measure stockpiles



## Clear Roads Survey on Monitoring Stockpiles of Solid Winter Maintenance Materials

### Technology Used to Measure Stockpiles

**1. What type of technology or device are you using?**

- Commercial product (continue with Question 2)
- Measurement system developed in-house (skip to Question 3)

**2. What is the name of the product and vendor?**

**Have you found that additional equipment beyond that provided by the vendor is needed to complete the measurement process?**

- No
- Yes (please describe the additional equipment needed)

**3. Please describe the hardware and software used for stockpile measurement and processing of data. ("Processing of data" refers to converting data collected in the field into the volume of a stockpile.)**

**4. Is the hardware mobile so that it can be taken to different stockpile sites to take measurements?**

- Yes
- No

**5. Does the hardware require calibration?**

- Yes
- No

**6. What type of stockpiles can be measured with the technology or device you're using? Check all that apply.**

- Indoor
- Outdoor
- Covered
- Uncovered
- Other (please describe)

**7. How many staff members are required to gather and process data?**

- 1
- 2
- 3
- More than 3

**8. What type of expertise is needed to gather and process data? Check all that apply.**

- No specialized expertise
- CAD
- GIS
- Surveying
- Other (please describe)

**9. Please describe the measurement process, including the processing of data collected in the field.**

**10. Approximately how long does it take to gather stockpile measurements in the field?**

- 15 minutes
- 30 minutes
- One hour
- Two hours
- Three hours
- More than three hours

**11. Approximately how long does it take to complete processing of the data gathered in the field?**

- 15 minutes
- 30 minutes
- One hour
- Two hours
- Three hours
- More than three hours

**12. Have you identified any methods to expedite the processing of data collected in the field?**

- No
- Yes (please describe these methods)

**13. How often do you take measurements? Check all that apply.**

- Weekly
- Biweekly
- Monthly
- Quarterly
- Annually
- Other (please describe)

**14. How is measurement data stored?**

- On agency computers
- Maintained by vendor; pay-as-you-go access
- Maintained by vendor; access is part of annual maintenance fee
- Other (please describe)

**15. How accurate are the measurements taken with your vendor product or in-house system as compared to actual inventories? Please provide a percentage or range of percentages. (For example, a vendor may state that a system, when properly used, can measure the volume of a stockpile to within 2-10% of actual.)**

**16. Please indicate your monitoring system's costs below, if applicable.**

Initial purchase of hardware and software

Annual fees for data usage and/or storage

Periodic fees for data usage and/or storage

Annual hardware maintenance fees

Annual software maintenance fees

Other costs (please describe and quantify the costs)

**17. Are you using your stockpile measurement practice to measure stockpiles of other types of solid materials (for example, aggregate or gravel)?**

- No
- Yes (please describe the other types of stockpiles you measure)

**18. Do you have any formal or informal policies or other documents that guide your stockpile measurement practices? Please provide a link below or send any file not available online to Chris Kline at [chris.kline@ctcandassociates.com](mailto:chris.kline@ctcandassociates.com).**

**19. What successes have you experienced with the technology you use to monitor stockpiles of solid winter maintenance materials?**

**20. What challenges have you experienced with the technology you use to monitor stockpiles of solid winter maintenance materials?**

**21. Please use this space to provide any comments or additional information about your answers above.**



## Clear Roads Survey on Monitoring Stockpiles of Solid Winter Maintenance Materials

### Other Methods Used to Measure Stockpiles

1. Please describe the method you use to measure stockpiles of solid winter maintenance materials.

Please describe any equipment you use to complete the measurement process.

2. What type of stockpiles do you measure with this method? Check all that apply.

- Indoor
- Outdoor
- Covered
- Uncovered
- Other (please describe)

3. How many staff members are required to complete the measurement process?

- 1
- 2
- 3
- More than 3

**4. Does your measurement process require any specialized expertise?**

- No
- Yes (please describe the expertise required)

**5. Approximately how long does it take to complete the measurement?**

- 15 minutes
- 30 minutes
- One hour
- Two hours
- Three hours
- More than three hours

**6. How often do you take measurements? Check all that apply.**

- Weekly
- Biweekly
- Monthly
- Quarterly
- Annually
- Other (please describe)

**7. How accurate are the measurements taken with your method as compared to actual inventories? Please provide a percentage or range of percentages.**

**8. Please describe any costs associated with your measurement method.**

**9. Are you using your stockpile measurement practice to measure stockpiles of other types of solid materials (for example, aggregate or gravel)?**

- No
- Yes (please describe the other types of stockpiles you measure)

**10. Do you have any formal or informal policies or other documents that guide your stockpile measurement practices? Please provide a link below or send any file not available online to Chris Kline at [chris.kline@ctcandassociates.com](mailto:chris.kline@ctcandassociates.com).**

**11. What successes have you experienced with your practices to monitor stockpiles of solid winter maintenance materials?**

**12. What challenges have you experienced with your practices to monitor stockpiles of solid winter maintenance materials?**

**13. Do you have any plans to transition from your current method to the use of technology to measure stockpiles?**

- Yes (continue with Question 14)
- No (skip to Question 17)
- I don't know/maybe (skip to Question 17)

**14. Please describe your plans to use technology to measure stockpiles, including the vendor(s) and product(s) you're considering.**

**15. What is prompting you to make this change in measurement practices?**

**16. When do you expect to implement the new measurement practice?**

**17. Please use this space to provide any comments or additional information about your answers above.**



## Clear Roads Survey on Monitoring Stockpiles of Solid Winter Maintenance Materials

### Completing the Survey

**THANK YOU!**

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Please click "Submit" below to transmit your data. This information will be very useful for winter maintenance managers nationwide.