

Standard analysis

Increase your ability to manage risk and enable continuous improvement



Analysis in winter management operations typically refers to how we analyze snow and ice conditions on paved surfaces we manage during snowy winter months. There are several areas of a snow and ice management operation to consider employing standards for analysis. The top five SWiM guidelines to include as a standard set of policies for analyzing your snow and ice management operation:

1 Analyze per event. Material outputs and inventories should be analyzed per event, per vehicle and per operator. How you measure the type (e.g., rock salt, etc.), and form (e.g., bulk, bagged, etc.) of this material will have direct bearing on how easy or difficult it is to capture and automate the data to be analyzed. Tracking with an aftermarket salt tracking GPS-enabled technology or from a salt spreader manufacturer's optional tracking equipment will enable an easier, reliable and more efficient option compared to traditional methods that are typically performed manually and with paper tracking.

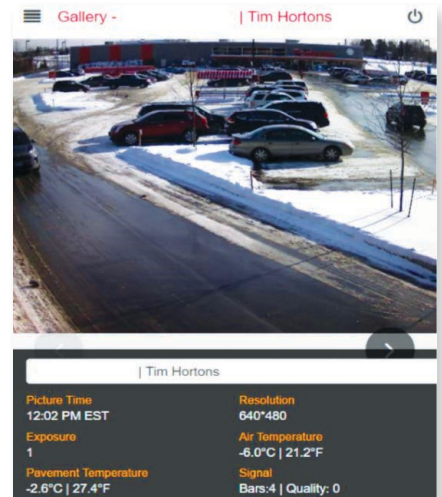
Date and Time in	Date and Time out		Quantity	Duration
21 Nov 2018 at 21:30	21 Nov 2018 at 21:32	Truck 413	95	0.02
21 Nov 2018 at 06:39	21 Nov 2018 at 06:41	Truck 413	146	0.03
21 Nov 2018 at 06:34	21 Nov 2018 at 06:36	Truck 413	178	0.02
28 Nov 2018 at 04:32	28 Nov 2018 at 05:38	Truck 413	7781	1.1
07 Dec 2018 at 05:26	07 Dec 2018 at 05:38	Truck 413	489	0.19
11 Dec 2018 at 17:03	11 Dec 2018 at 17:39	Truck 413	1551	0.59
30 Dec 2018 at 06:52	30 Dec 2018 at 07:38	Truck 413	5333	0.77
10 Jan 2019 at 05:18	10 Jan 2019 at 05:59	Truck 413	6636	0.68
19 Jan 2019 at 06:35	19 Jan 2019 at 06:53	Truck 413	1042	0.29
19 Jan 2019 at 06:02	19 Jan 2019 at 06:30	Truck 413	3547	0.46

USE YOUR DATA: GPS-enabled tracking data allows analysis of salt applications.

2 Figure stop and starts. Production efficiency and waste are two sides of the same coin to analyze. Analyzing production starts with tracking times for the primary operations such as anti-icing, plowing, deicing, ice watch, travel, loading and unloading and other job costs.

Once you can consistently and reliably track time and materials usage, you can then analyze by person, crew and event to determine where inconsistencies and waste exist.

3 Tracking service levels. Level of service (LOS) and quality of service are equally important to analyze. Client or end user feedback is the foundational measurement to analyze, including use of surveys, tracking



APPLICATION CHECK: Raw data derived from GPS technology provides the ability to analyze salt application data at a single vehicle/operator view. This also allows managers to see variability in application rates, durations of time and comparisons between other vehicles and operators.

EDITOR'S NOTE: This article is the fifth in a series that discusses policy, methodologies and environmental stewardship through the lens of sustainability as it applies to winter management operations. Each issue will look at one of the six categories of SWiM policy standards:



- **Measure** what you want to improve
- **Calibrate** equipment capacity, manpower, response times, salt and other materials
- **Prevent** bonding of snow and ice, waste, re-work and safety incidents

- **Analyze** Level of service, data and variances
- **Improve** safety, level of service, productivity
- **Optimize** equipment, materials, time and data

complaints and other feedback data. Triggers, thresholds and timing of service are minimum standards that should be assessed after each storm to confirm if basic expectations are being met consistently. Requests for services that are considered outside the agreed scope of work (SOW) should be tracked and analyzed to provide a benchmark for assessing if additional requests for services have reached a

level for inclusion in a future SOW.

How you track service levels and quality achieved are up to you. Pictures being worth 1,000 words is true for analyzing snow management. Onsite weather cameras or other types of road weather information systems are examples of more sophisticated technologies that enable automated monitoring of LOS and quality. Other manual methods include utilizing phone cameras that can be downloaded to a customized cloud-based data capture system (e.g., Google, Dropbox, etc.). These are reasonably cost-efficient means of capturing data provided you understand the manual time commitment required.

4 Weather data. Weather analysis includes using historical weather data as a benchmark to compare with seasonal budgets or contract agreements. Because no two seasons are alike, weather data can be used to help “normalize”

Comparisons	Customer Slips '17-'18	Employee Slips '17-'18	Customer Slips '18-'19	Employee Slips '18-'19
PROPERTY #1	0	2	3	1
PROPERTY #2	0	0	0	2
PROPERTY #3	5	0	1	0
PROPERTY #4	3	1	4	0
PROPERTY #5	0	0	1	0
PROPERTY #6	1	5	3	1
PROPERTY #7	3	3	0	2
PROPERTY #8	5	1	0	5
PROPERTY #9	6	1	2	2
TOTAL	23	13	14	13

RISK MANAGEMENT: Example showing annual slip and fall incident comparisons for retail properties.

seasonal averages for accumulation types and quantities of occurrences. Averages can then be used to establish normalized seasonal budgets and seasonal contract agreements that are required for properties and contractors to qualify for SWiM certification.

5 Managing risk. Safety is typically measured and analyzed comparing incident experiences from one season to a next or as a year-over-year comparison. When comparing the most common incident (i.e., slips and falls), a simple way to analyze year-over-year experience is by utilizing a simple spreadsheet model for tracking

and reporting your comparisons.

Increasing your ability to manage risk and enable continuous improvement is possible when you practice the Analyze policy and other SWiM guidelines. These guidelines are designed to help snow and ice management operations start with a simple set of criteria. It's up to you how you want to build from them. **SB**

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