DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING

8-2

# Pass The $alt

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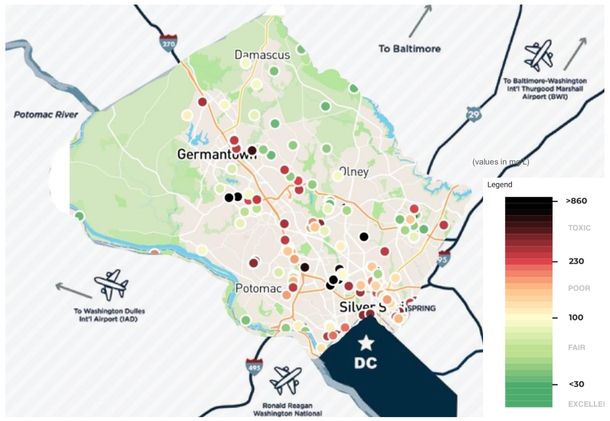
## A. Problem Definition

Montgomery County, MD faces increasing environmental and infrastructure problems from excessive winter road salt use. Excess salt raises chloride and sodium levels in local waterways. Continued corrosion and contamination could negatively impact stream health, aquatic ecosystems, drinking water quality, and built infrastructure. Although the County promotes salt reduction there is no existing program to reduce salt use.

**Large uncovered salt pile leftover from private contractors. (Image: Mark Kuperman)**




**Montgomery County chloride levels in mg/L, from <30 in green (good) to upwards of 860 in black (toxic). (Source: Clean Water Hub, data from 2025-2026)**

**Project Goal:** Our aim was to create a financially incentivized road salt reduction program for Montgomery County which would allow the County to reduce salt usage by 10% in the next year.

## B. Methodology

1. Research existing salt/chloride reduction efforts worldwide
2. Read local counties' current road salt use plans
3. Interview salt/chloride reduction program coordinators
4. Interview snow maintenance contractors/consultants
5. Create criteria for decision matrix
6. Analyze all interviews & research
7. Fill out decision matrix to determine most ideal (final) rec.
8. Financial plan for final recommendation
9. Salt applicator outreach (marketing) plan for final rec.

## C. Selected Research

County-Level Salt Management Plans in Maryland

| County | County Population | County Size ($mi^2$) | Winter Budget | Equipment Used |
|---|---|---|---|---|
| Montgomery County 2024 Plan | 1.1 M | 507 | 6,650,000 | Trucks, plows, spreaders |
| Baltimore County 2024 Plan | 850 K | 598.4 | 8,500,000 | Trucks, plows, spreaders, brine, computerized controls |

Programs

| Program | Source Type | Decision matrix rec. this informed | Directly mentions salt reduction? | Program active/ not active? | Financial incentive? |
|---|---|---|---|---|---|
| Car Parts Retailer Car Battery Buyback Program | Interview | 3 | ✗ | Active | ✓ |
| Madison Metropolitan Sewerage District Chloride Innovation/Salt Reduction Grants | Interview, report, grant | 5, 1, 7 | ✓ | Chloride innovation active, Road salt reduction inactive (ended) | ✓ |
| City of Gaithersburg Road Salt Drop-off Program | Interview | 1, 10 | ✓ | Active | ✗ |
| New York State Water Quality Improvement Program (WQIP) | Report, grant | 4, 7 | ✓ | Active | ✓ |

Contractor/Consultant Interviews

| | Decision matrix rec. this informed | Company Size (Approx.) |
|---|---|---|
| Large Local Landscaping Company Regional Snow Manager | 3 | $400+ Million |
| Water Resources Senior Project Manager for an Engineering Consulting Firm | 2, 9 | $250+ Million |

## D. Decision Matrix

Recommendations gleaned from our research were rated by how well they addressed specific criteria. The three most important criteria were ***1. financial cost to county, 2. expected participation by private businesses, & 3. collateral environmental impact***.

***"Invest more into current training courses & expand materials" (with stipend/gift card/raffle for attendees as the final incentive)*** was our most ideal suggestion and used to inform our financial plan and out salt applicator outreach plan.

## E. Recommendations

Recommendations gleaned from research and ranked by decision matrix are as follows:

| | |
|---|---|
| ***1. Invest more into current training courses & expand materials with stipend/gift card/raffle for attendees*** | 6. Brine low interest loans |
| 2. Create an informative class/seminar about winter maintenance precision equipment with stipend/gift card/raffle for attendees | 7. Salt equipment upgrade grant |
| 3. Road salt takeback program with stipend/gift card/raffle for participants | 8. Salt equipment upgrade low interest loans |
| 4. Brine grants | 9. Modifying existing equipment grants |
| 5. Old equipment dropoff/recycling program with stipend/gift card/raffle for participants | 10. Government-provided brining stations with discounted brine |

## F. Financial Plan

We restructured the current budget by assuming a 10% reduction in salt use countywide. This decreased the amount of money spent by just of $50,000, which allows for that money to be spent on new equipment and educational programs to reduce the amount of salt needed.

## G. Salt Applicator Outreach

| | |
|---|---|
| Outreach | Cold calls by interns, rebrand courses, ads in The Sentinel & local weather radio |
| Presence | 5+ course offerings throughout the year, booths at Mid-Atlantic Nursery Trade Show |
| Incentives | Advertised stipends, gift card raffles, branded swag |

## H. Final Takeaways

Montgomery County can successfully reduce its salt usage by at least 10% in the next year. This can be achieved by making advances in the equipment used and educational programs to better educate salters and contractors on how to more efficiently and effectively salt roads. This reduction in salt use will decrease the chloride levels in the nearby waterways which will help improve the environmental well-being of the ecosystem.