

Memo on Snow Removal

The February 1969 snow storm in New York necessitates the investigation of the city's snow fighting capabilities, namely what it will take to prevent such an occurrence from every happening again. However, in our efforts to avoid a repeat of the aftermath of the snow storm, we face considerable constraints based on the city's budget. Certainly, it is the case that snow storms of the variety experienced in February of 1969 are exceedingly rare, and a dollar spent on fighting snow storms requires the city to either raise an additional dollar through tax revenues, or by repurposing a dollar from another function.

The first item which we must examine is the ability of our city to eliminate snow when it falls. Spreading salt is called the "first line of defense" when it comes to snow removal. Salt spreaders are ordered out at the first sign of snow or freezing rain, and work very effectively in snows up to 5 inches. Additionally, if traffic exists on our streets, the usefulness of these spreaders multiplies, packing the snow tightly, and increasing the effectiveness of the salt used to melt the snow. Finally, these salt spreaders are especially effective when fighting a storm which has been accurately forecast, causing the snow to melt immediately, and mitigating some of the lost effectiveness of the storm due to quickly accumulating snow.

Unfortunately for us, the storm which the city experienced was extremely large—bigger than 5 inches, occurred on a Sunday, and was not properly forecast. This almost entirely marginalizes salt spreaders. Snow accumulating in those amounts renders spreaders essentially useless, the occurrence on a Sunday means that traffic cannot help us pack the snow, and without a proper forecast, we cannot mitigate the marginalization of the snow spreaders. In storms like these, further investment in spreaders is essentially useless because spreaders are completely unable to fight storms of this magnitude.

The second line of defense in the face of a snow storm is that of snow plows. Snow plows can remove up to 8 inches of snow at a time, and work at 5 MPH when plagued by traffic, and at 15 MPH when unmitigated. This equates to an average MPH (roughly) of 10 MPH at which a plow can work. Given that there are 1760 plows in the city, this means that the city has the potential to plow up to 17,600 “plow miles.” The summed amount of “plow miles” in the city on primary, secondary, and tertiary roads is 13,276. In essence, the city has the capacity to plow all of the streets in the city, if plows operate with at least 75% efficiency.

A question can be raised here about the fact that the February 1969 New York snow storm was 15 inches, while snow plows only are operable with snowfall at 8 inches. However, this report states that plows have the capacity to remove all of the snow in the city. This is the case because of accumulation rates. Exhibit 3 in this case showcases that even in the 8 hours of heaviest snowfall, the accumulation rate was only 7.4 inches, meaning that even if snow was to fall at its peak accumulation rate for 8 hours straight, the plows should have cleared the snow.

Since our plows obviously proved ineffective, the biggest issue causing this crisis is the problem of distribution, that is, the allocation of snow removal infrastructure in each district across the city. Exhibit 8 showcases the plow distribution across the city, and also reports the total amount of plow miles in each borough. From this, we can derive an equitable distribution of plow miles for which each plow must be responsible. Once we have this figure, we can derive how many plows ought to be in each borough, and from there, what the net change in plows must be. This chart, once derived, looks like this:

Sanitation Boroughs	# Plow-Bearing Trucks	Primary Streets	Primary and Secondary Streets	All Streets	Correct Allocation	Change
Manhattan West	162	626	739	746	99	-63
Manhattan East	189	473	583	584	77	-112
Bronx West	157	485	690	820	109	-48
Bronx East	148	726	919	1240	164	16
Brooklyn West	194	699	922	1154	153	-41
Brooklyn North	203	548	778	942	125	-78
Brooklyn East	173	495	740	1387	184	11
Queens West	226	1079	1787	2034	270	44
Queens East	238	1523	2215	2745	364	126
Staten Island	70	676	1460	1615	214	144
TOTAL	1760	7330	10833	13267	1760	0
Plow miles/Plow	7.538068182					

If this allocation is realized, the amount of time getting to and from places of work may be minimized, getting us as close as possible to 75% efficiency, which would allow us to clear all of our roads. However, the issue becomes this: snow plows are also used as garbage collection trucks, which are likely allocated to specific boroughs based on their need in that function.

So what are we to do? The fact of the matter is that the weather service is only wrong 30% of the time. Additionally, Saturday and Sunday (light traffic days) are only responsible for 2 days of the week—and we must also factor in the fact that sporting events may drive up traffic on these weekends. Finally, this storm was incredibly large—and likely not to repeat itself. The facts being thus, it is most advisable to make no major changes to the way in which we do things, but to increase our preparedness to face storms of these magnitudes by developing contingencies for freak occurrences. By allowing sanitation workers to report for duty whenever they feel the need to do so, and by allowing private owners of bulldozers the ability to earn a premium for plowing underserved areas, we can be prepared for such a freak occurrence without encumbering financial strain by forcing ourselves to buy additional infrastructure. A financial analysis ought to be conducted comparing the cost of these premiums to the alternative—investing in more plow infrastructure.