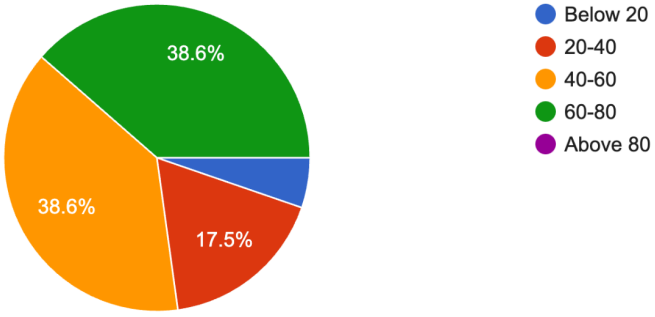
Study Participants

1. Participants and Facilitators -
    a. Our survey reached individuals across various age groups and regions, with about 78% of respondents between the ages of 40-60 and 60-80.
    b. The survey primarily included residents from Massachusetts and New Jersey, providing insights from areas frequently affected by snow.
    c. The survey facilitators included team members Ethan Goldman, Tyler Mackowski, Will Baise, Emma Gonzalez, and Varun Suresh Nair, who designed questions to gather data on user habits, challenges, and expectations for snow removal.

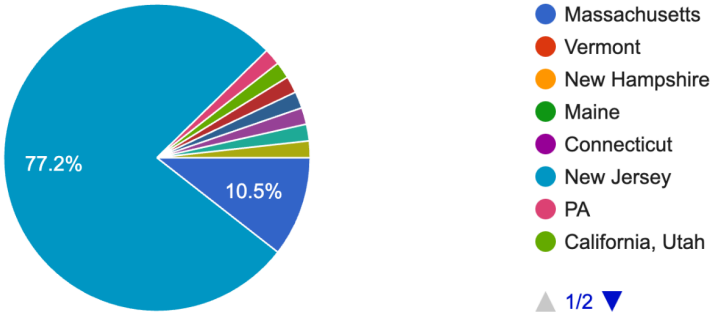
What age range do you fall under?

57 responses



Where are you from?

57 responses



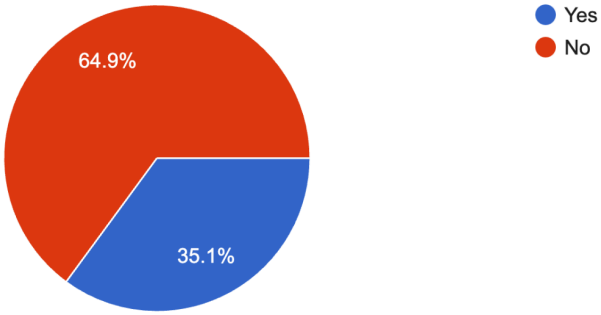
2. <u>Perspectives in the Design Process</u> - The survey responses highlighted several important perspectives.
    a. Notably, 61% of respondents remove snow themselves, and 35% have a preexisting condition (like arthritis or back problems) that makes snow removal challenging.
    b. This information underscores a significant need for solutions that reduce physical strain, especially for users with limited physical capabilities.

Do you remove your snow?

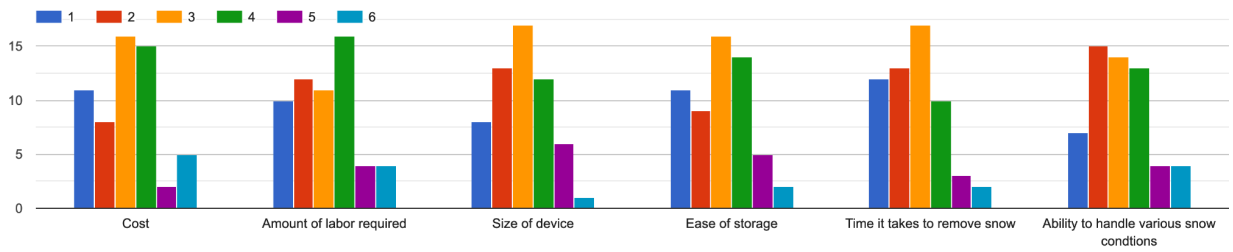
57 responses

Do you have a preexisting condition that makes snow-removal difficult for you (i.e. bad back, arthritis)

57 responses



Rank the importance of the following in a snow removal device:

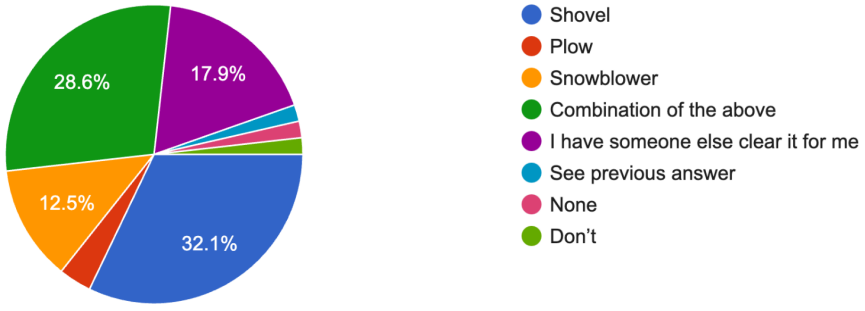


3. <u>Alignments and Divergences in Priorities -</u>
    a. Our team's priorities largely aligned with the respondents' needs for ease of use and labor reduction. Interviewees were particularly concerned with the amount of time it takes to use the device to remove snow.
    b. One design priority that interviewees mentioned that we had not previously considered are the warmth of the user's hands as they remove the snow
        i. When asked **"Are there any other considerations that you feel are important when evaluating a snow removal tool?"** an interviewee responded: "Water proof gloves"
        ii. When asked **"Are there any improvements or features you would like to see made to your snow removal device?"** an interviewee responded: "Built in heating on the handle so my hands don't get cold when shoveling."

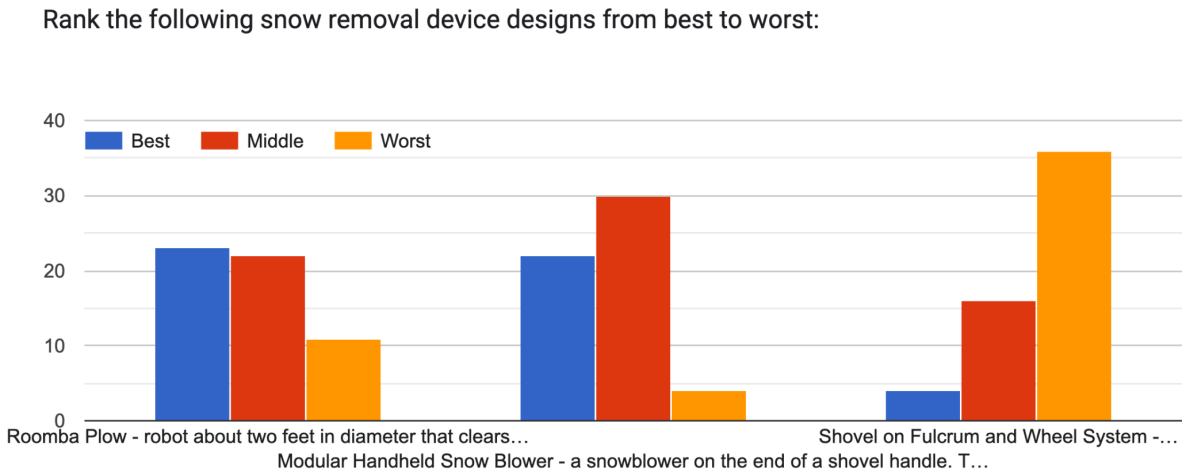
4. <u>Missing Perspectives -</u>
    a. A gap exists in responses from users with experience using automated snow removal tools. Only 12% of our respondents use a snowblower to clear snow. 32% use a shovel.

What is your current method of removing snow from your driveway?

56 responses



Learnings:



What Did We Learn?

1. *Resolved Issues -*
    a. The survey helped resolve some ambiguity around the importance of device versatility and maintenance. For example, the majority of participants ranked the ability to handle various snow conditions as a top feature, confirming the need for adaptability in our designs.
    b. Respondents also expressed a preference for minimal maintenance, particularly for tools they could easily store and access.

2. *Impact on Perspectives and Ideas -*
    a. As a result of these insights, our perspective has shifted to place a greater emphasis on versatility and user control.

    b. Originally focused on innovative automation, we now see the need to offer familiar yet improved options that empower users, especially those who may find traditional methods difficult but are uncertain about robotic solutions.

3. *Changes in Priorities/Objectives* -
    a. Our initial design priorities have broadened to emphasize ease of use and accessibility.
    b. Based on feedback from 35% of respondents with physical conditions that complicate snow removal, we're now placing a stronger focus on features that minimize physical strain.
    c. This also includes reconsidering certain design features to accommodate users who prefer non-automated tools.

New Open Issues

The survey responses raised several questions that warrant further investigation:

1. **Trust in Automation**: How can we improve user confidence in automated options like the Roomba Plow, which received less approval?
2. **Storage Solutions**: How can we make innovative snow removal designs compact enough for users with limited space, given that some of the respondents noted storage as a significant factor?
3. **Ease of Maintenance**: What specific features can ensure that our designs are low-maintenance yet effective, particularly for those who ranked labor reduction and efficiency as top priorities?