

Part 1B - Project Proposal

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Problem 1:

When snow falls on roads it becomes dangerous for drivers on the road.

Problem (~200 words)

The problem we are choosing to focus on is how dangerous the roads become when it is snowing or raining. This is because poor weather conditions result in approximately 22% of the accidents that occur each year. Nearly 2,000 people die and over 135,000 people are injured each year due to car accidents on icy and snowy roads. We were inspired to do this because of the many accidents that occurred in Fort Worth, Texas, this year due to the icy road conditions. Our hope is to find a way to make the roads safer to drive on and decrease the number of fatalities and injuries. We want our product to work on all types of roads and be a cheap enough solution to be used on all roads, especially ones that get the heaviest traffic. If we could, we would even like to consider a specific part of the overall problem as well. It would even be better if we could figure out a way to keep the roads dry because 74% of all weather-related car accidents are due to wet roads. If we could improve both snowy and wet conditions on roads, we believe many lives could be saved yearly and many more accidents and injuries could be avoided.

Analyze (~200 words)

Currently, the solutions to this problem are to send out special vehicles to plow the snow off the roads and spread salt on the roads to help melt the ice on the roads. We should keep this system in place even with a new system because it is still very helpful with clearing up lots of snow. This system is helpful however it is not a perfect method. These vehicles usually focus on main roads and often neglect roads with less traffic. These vehicles go out early in the morning which is usually before anyone gets on the roads. Although, sometimes the snow starts to fall later in the afternoon while there is heavy traffic. There are also drivers that are on the roads at all hours of the day. Some areas of the world are more effective at clearing the snow than others. We would like to be able to clear any roads easily no matter their location or number of snow plows they have available. As far as rainy roads though there is not a real solution to keeping the roads dry. Gravel roads get more gravel added to them every so often to help with friction, but this is not to specifically help with rain. All of these are problems that we are taking into consideration when trying to find a solution.

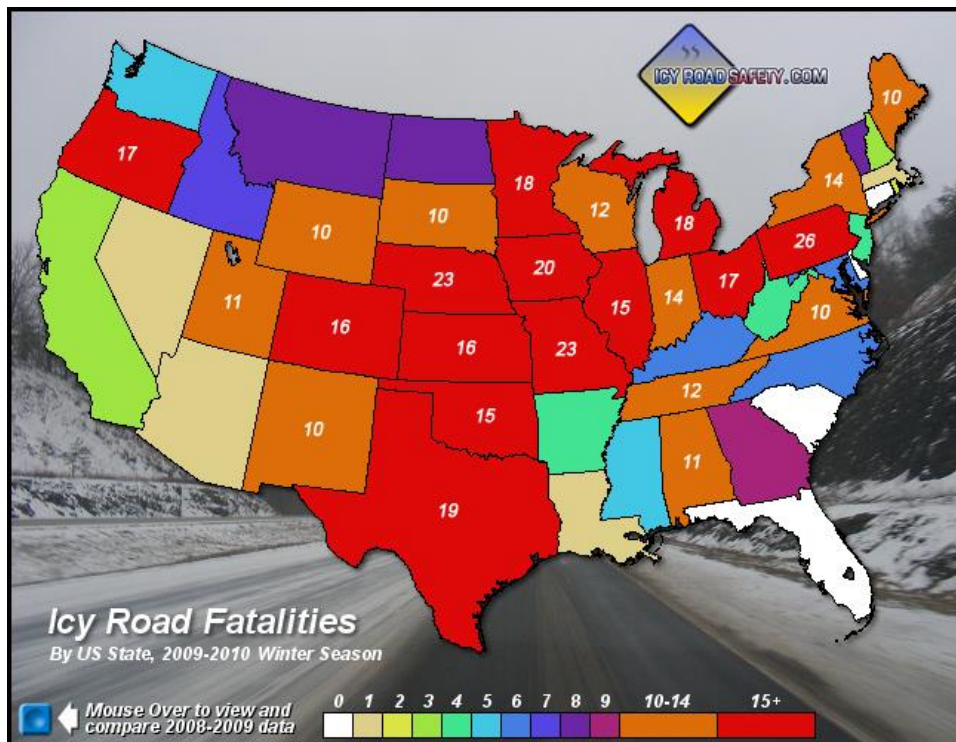
Feedback (~200 words)

The initial feedback we received was that we would need to be able to include some sort of user interface to our solution, in addition to a piece of technology/smart device. While we are unsure of exactly how we would implement that at this time, we believe we could find a way to do it. Maybe we could potentially use an app to monitor road conditions, somehow connecting data from weather forecasts and the department of transportation to inform drivers on when and where it is safe to drive. We would also have to solve a few more problems in order to

implement our idea, such as we would need to figure out how to effectively and preferably cheaply implement our idea. There are obviously millions of roads that could use a way to make them safer to drive on quickly in order to prevent the most accidents as possible. We also told that other countries with heavy snowfall such as Canada handle their snow and ice on roads much quicker and more efficiently than the U.S., so it would probably be beneficial to look more into what processes and devices they use to solve the same problem.

Contributions

- 25% Stephanie - made group chat, shared this word doc, helped with feedback paragraph, came up with 2 other ideas for part 1A, found pictures and charts
- 25% Kristina- came up with original idea in this document and which we received feedback for, pitched idea to the class
- 25% Shaun - helped set up discord so we could talk to each other, helped with feedback, typed and turned in part 1A
- 25% Kaitlyn - wrote majority of problem and analyze paragraphs, found statistics and facts to back up our arguments



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|-----------------------------|------------------------|------------------------|
| Snow/Sleet | 210,341 crashes | 4% of vehicle crashes |
| | 55,942 persons injured | 3% of crash injuries |
| | 739 persons killed | 2% of crash fatalities |
| Icy Pavement | 151,944 crashes | 3% of vehicle crashes |
| | 38,770 persons injured | 2% of crash injuries |
| | 559 persons killed | 2% of crash fatalities |
| Snow/Slushy Pavement | 174,446 crashes | 4% of vehicle crashes |
| | 41,597 persons injured | 2% of crash injuries |
| | 538 persons killed | 2% of crash fatalities |

Both above from: <http://icyroadsafety.com/fatalitystats.shtml>



Fredericksburg, Pennsylvania, Feb. 13, 2016

<https://weather.com/safety/winter/news/weather-fatalities-car-crashes-accidents-united-states>



Fort Worth, Texas, Feb. 11, 2021

<https://www.aljazeera.com/news/2021/2/11/at-least-five-dead-in-massive-texas-crash-after-icy-storm>