

# JAM: A Multilingual Electronic Traffic Sign

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## Problem Statement

The problem our prototype addresses is non-English speakers not being able to read important emergency and road sign updates in our community.

## Objective

The objective of our prototype is to display multiple languages on local traffic signs for non-English speakers, using an ultrasonic sensor to detect and activate the message when drivers are close by.

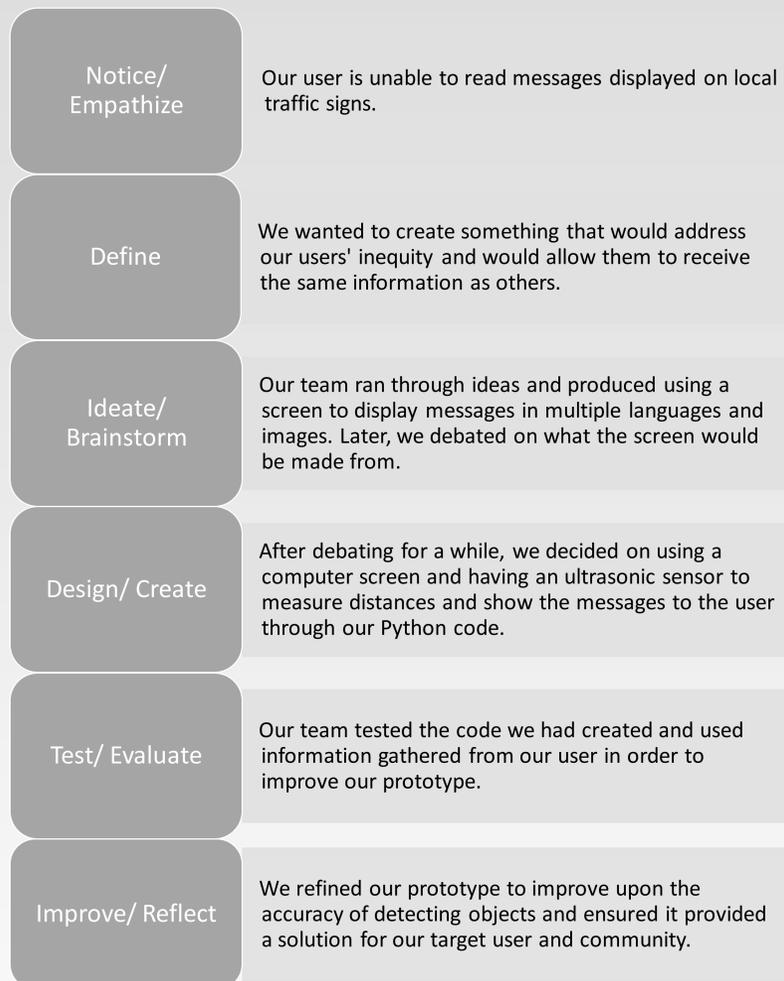
## User Requirements

Our prototype addressing our users' needs by displaying messages in different languages.

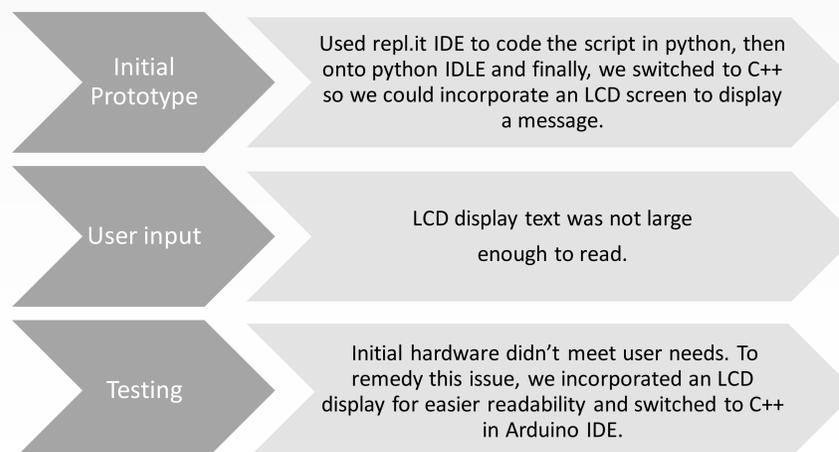
User Needs	Prototype Fix
<ul style="list-style-type: none"> <li>Keeping words on the sign long enough so they are readable</li> </ul>	<ul style="list-style-type: none"> <li>Program changes readable languages every two seconds</li> </ul>
<ul style="list-style-type: none"> <li>Clear and large words that are readable</li> </ul>	<ul style="list-style-type: none"> <li>Will include changeable fonts</li> </ul>
<ul style="list-style-type: none"> <li>Images to help understand the information that is being shared</li> </ul>	<ul style="list-style-type: none"> <li>Will be able to display images in the messages</li> </ul>
<ul style="list-style-type: none"> <li>Not distracting</li> </ul>	<ul style="list-style-type: none"> <li>Displays text on a screen</li> </ul>

## Design Process

Our design process is listed below:



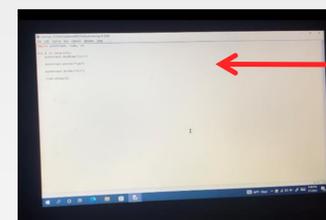
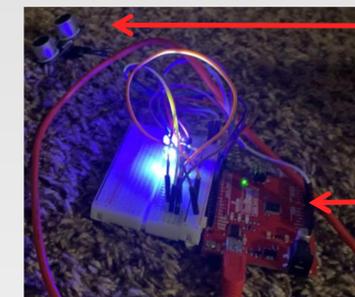
## Design Iterations



## Data

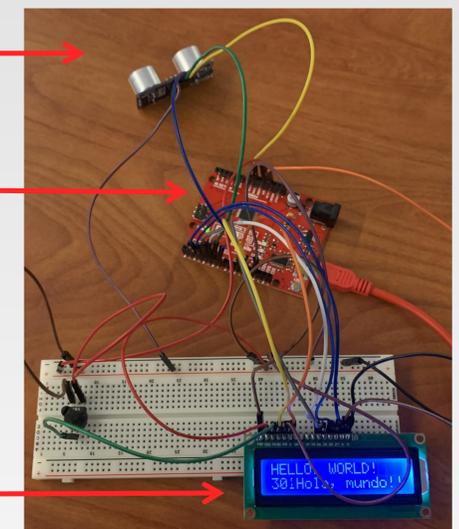
About 18.7 percent of people in the US are Latinos making the chance of the amount of people on the road who can't read in English, dangerously high. There are also 32 million adults in the US who just can't read in general, our signs would also be able to display images to help with this. In our school district, there are over 65% of students that either do not speak or communicate well in English.

## Initial Prototype Testing



## Final Prototype Testing

Prototype iterations improved by components working together.



Ultrasonic sensor measures distances.

RedBoard runs the code automatically based on the data communicated from the ultrasonic sensor.

The key components of the initial prototype ran independently.

LED screen displays the message.

## Testing Process

- We put objects in front of our ultrasonic sensor at specific distances to see if the sensor detected the objects.
- We tested code to make sure the program was working as intended.

## Results

The prototype completes all the tasks and is fully automatic once the script has begun. Our design shows a message in multiple languages when the ultrasonic sensor detects an object close by. It will help non-English speaking people in our community be aware of their surroundings and important emergency and safety updates. In the end our product works together so depending on the distance, our sign will display different messages in different languages.

## Conclusion

Our prototype met our user's needs by being able to display messages in different languages and showing those messages for a long enough time so that everyone would be able to read it. If we could continue the project, we would get a bigger LCD screen and getting a better ultrasonic sensor, but this of course could all be done if our prototype was brought to scale.