

THE FLAT HOUSE



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ABSTRACT

According to a study done by AARP in 2011, 89% of people 50 and over would like to live on their own for as long as possible. One key aspect of this is the ability to negotiate the environment they live in. As people age, there are a variety of factors that make moving harder, ranging from pains and aches to walking aids like canes and crutches all the way to wheelchairs. These make life on flat ground difficult enough but stairs greatly amplify the problem.

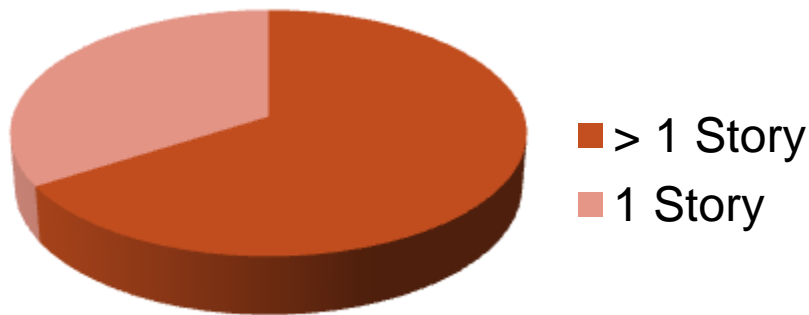
Our goal is to create a device that addresses this problem and allows people to **age in place**. We want to make a single step or set of steps easily managed and much safer for those that are not able to walk at full capacity. We aim for these devices to work on **existing steps and not require remodeling or construction**. The device must be **economical, aesthetically pleasing, easy to use, and space conscious**.

PROBLEM STATEMENT

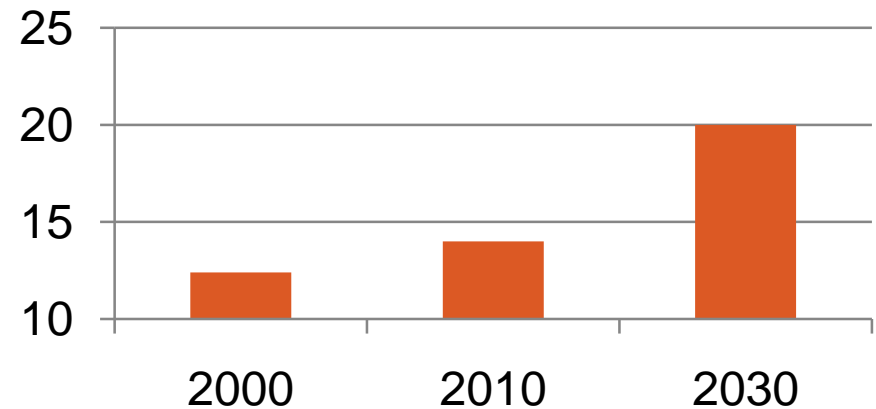


MAGNITUDE OF PROBLEM

US Housing Units
132 million



Percent of US Population
over 65 years old



- **19 million** report trouble climbing stairs
- **7 million** use mobility assistance devices
- **12,000 deaths/year** due to stairs
- Second only to automotive accidents

INTERVIEWS



Jack Moorman
CEO LeVaunt
Project Sponsor



Morgan Duffy
Stanford Student



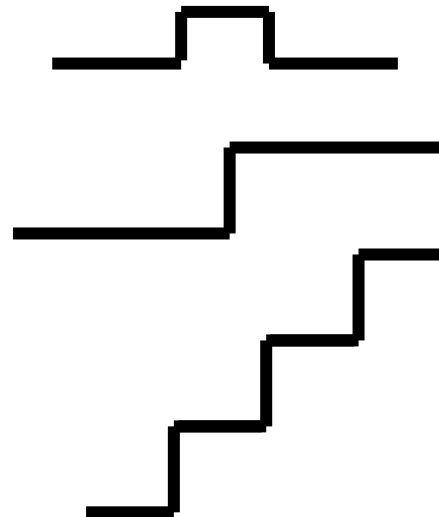
Lynette Evans
A Friendly House

STATEMENT OF NEED

People with mobility impairments to safely navigate houses with non-obvious steps or sets of steps.

Problem types:

- Lip
- Single step
- Staircase



EXAMPLE



EXISTING SOLUTIONS

Ramps



Lifts



Exoskeletons

Stair-aids

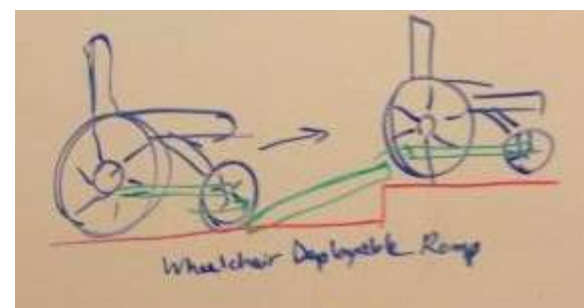
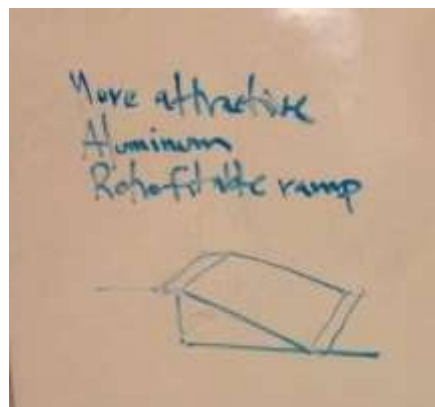
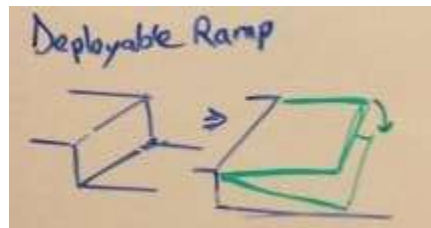
Wheelchair Assist



Climbing Wheelchairs



BRAINSTORMED DESIGNS

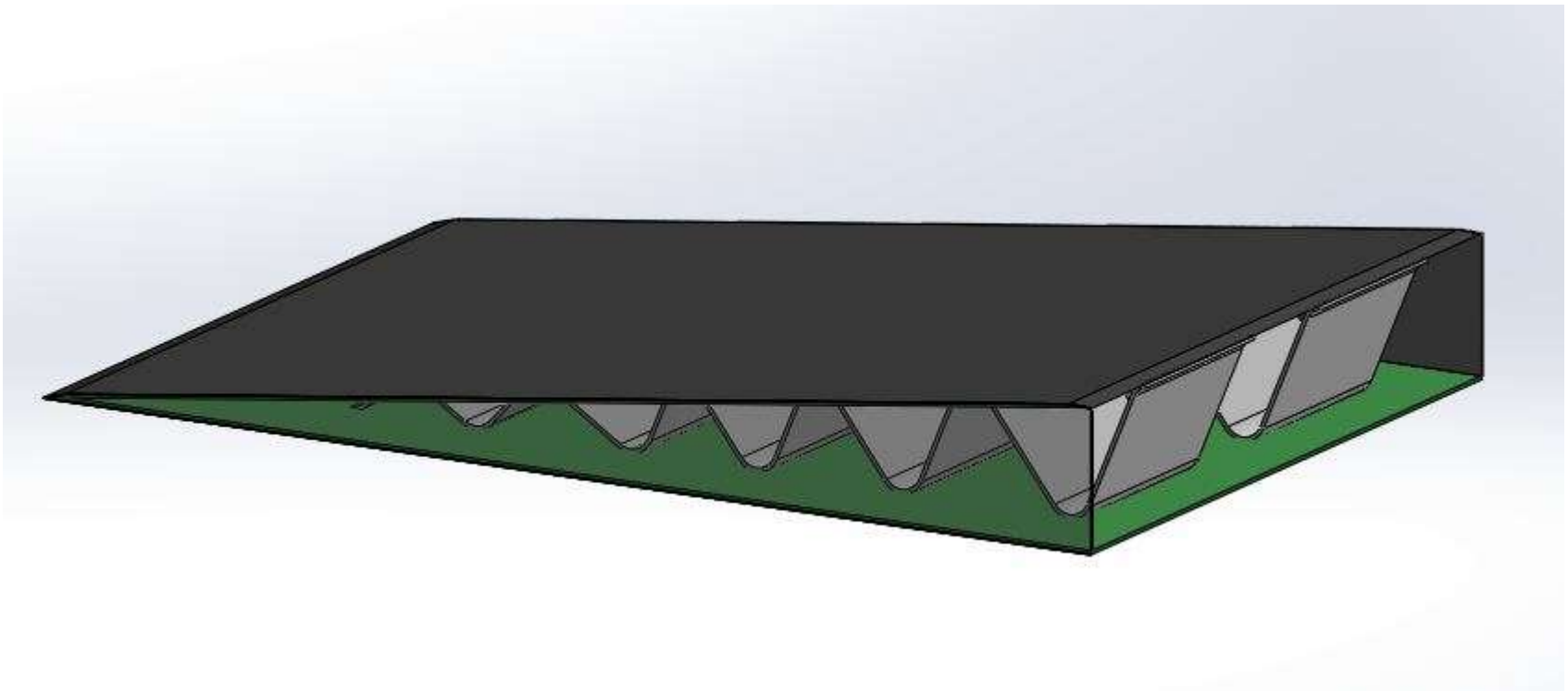


CHOICE ANALYSIS

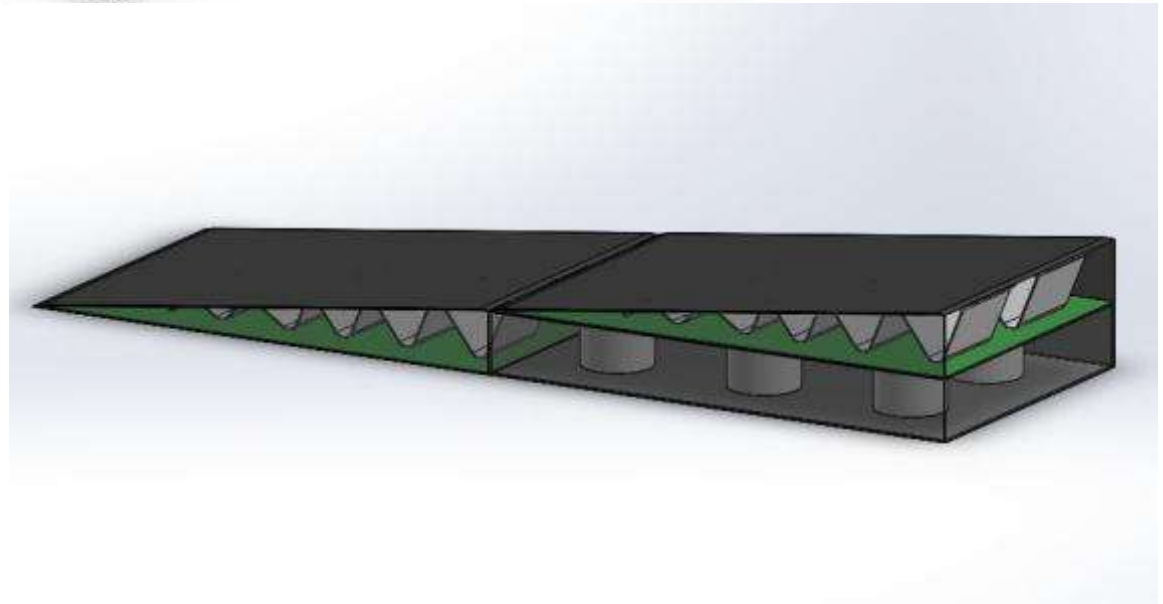
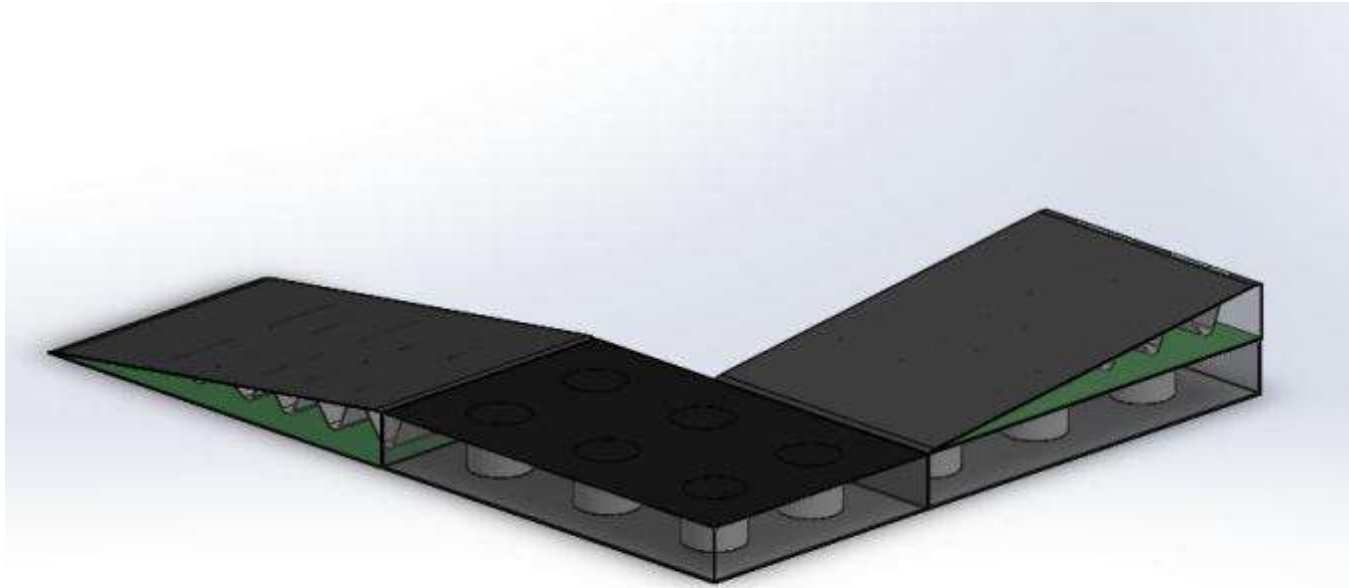
- **Explored products for different users (those with wheelchairs, scooters, canes, etc.)**
- **Considered devices that are permanent, modular, or fixed to another device**
- **Considerations**
 - Setup time
 - Ease of use
 - Aesthetics
 - Cost

SELECTED DESIGN

Modular, Low-cost, Aesthetically-pleasing Ramp



DESIGN VISUALIZATIONS



MOVING FORWARD

- **Continue prototyping/brainstorming**
- **Be sure to have plenty of user testing**
- **Begin to decide final choices**
 - Materials
 - Manufacturing