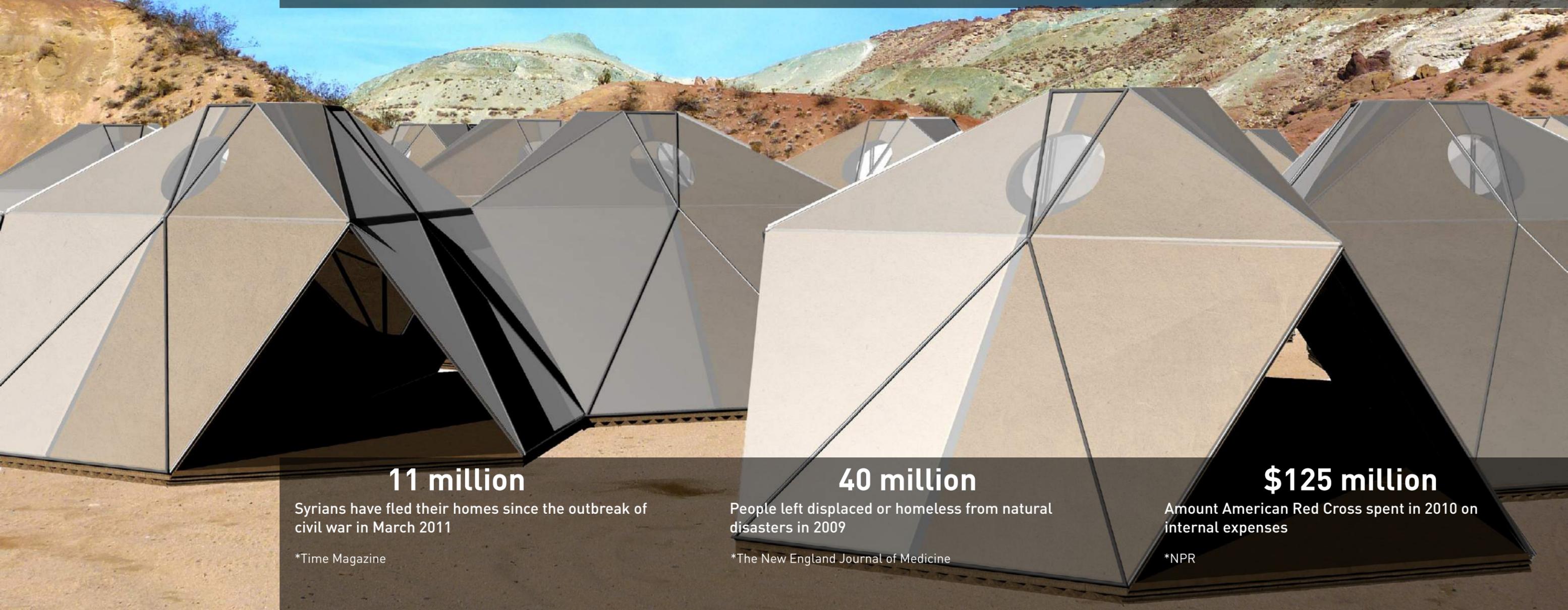


Project Nomad

# Low cost emergency living for refugees

Housing design / Architectural study

The Nomad Shelter provides low cost modular housing made of inexpensive materials. The shelters can connect and form communities, keeping refugees' sense of family and community intact during an otherwise difficult time.



**11 million**

Syrians have fled their homes since the outbreak of civil war in March 2011

\*Time Magazine

**40 million**

People left displaced or homeless from natural disasters in 2009

\*The New England Journal of Medicine

**\$125 million**

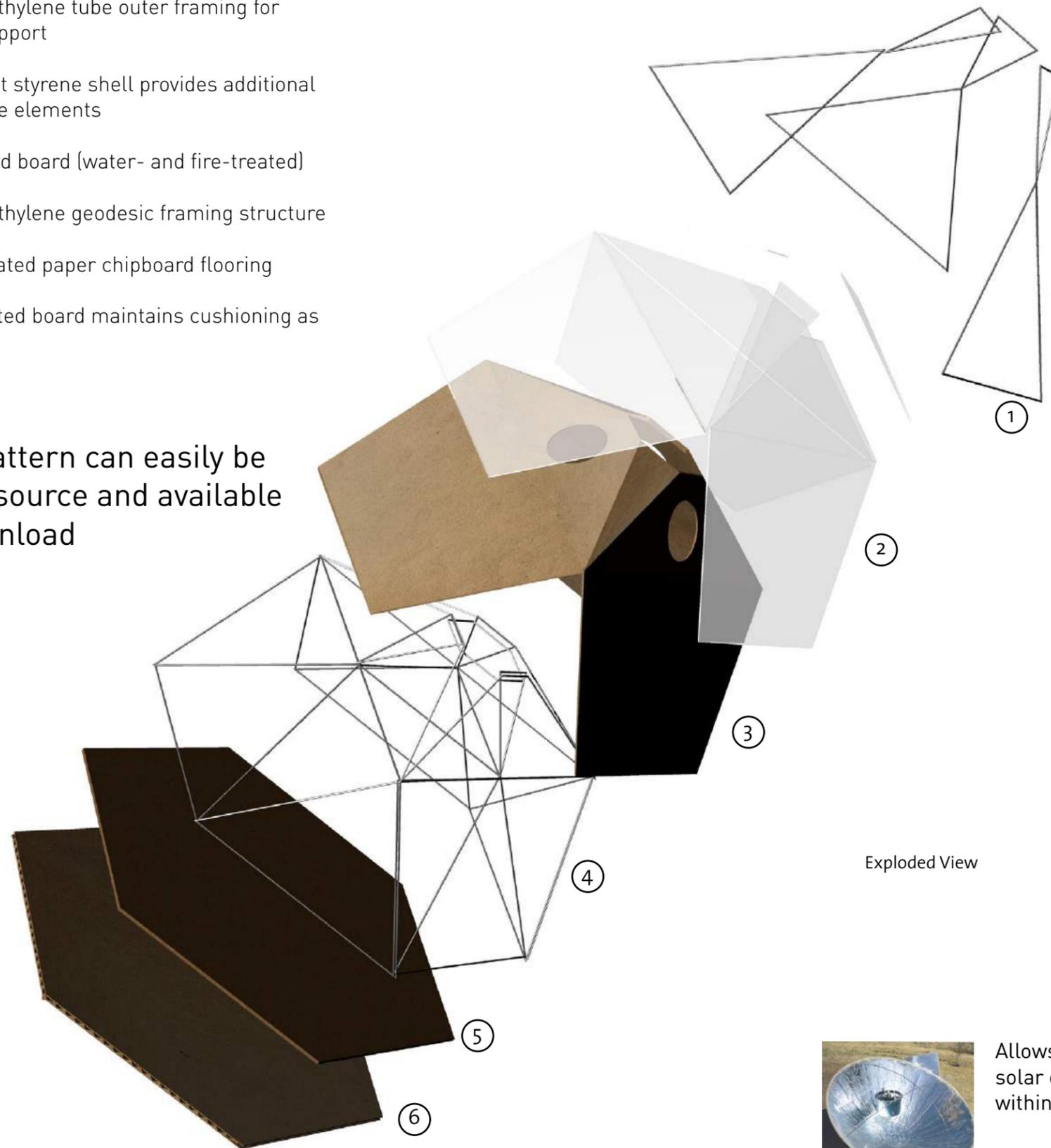
Amount American Red Cross spent in 2010 on internal expenses

\*NPR

# Nomad Shelter Construction

- ① High density polyethylene tube outer framing for additional axial support
- ② 0.020" high impact styrene shell provides additional protection from the elements
- ③ AB flute corrugated board (water- and fire-treated)
- ④ High density polyethylene geodesic framing structure
- ⑤ 85 pt. Non-corrugated paper chipboard flooring
- ⑥ ABB flute corrugated board maintains cushioning as cheap foundation

Flat-pack pattern can easily be made open source and available for free download



Exploded View

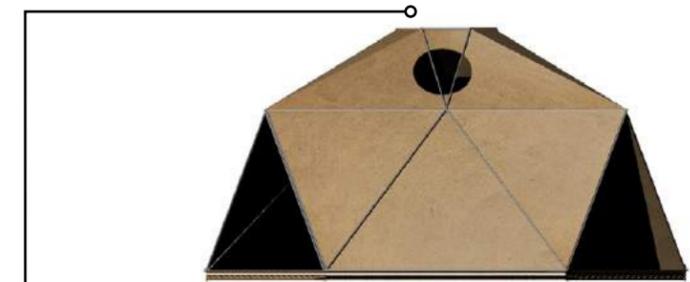


Allows for possible attachment of solar cooking. (May be hoisted up within shelter)

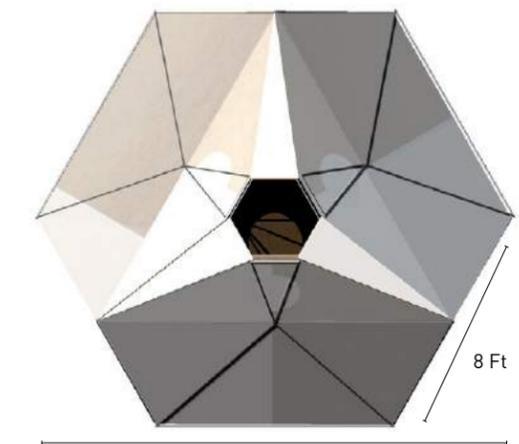


Perspective View

Optional solar panels may be installed on other side of transparent styrene layer.



Side View



Top View

## Research

### Day in the Life



Meet Jana

Jana is a 22 year old Syrian Refugee. She lives in a refugee camp just outside of Jordan.

She and her family were displaced during political unrest. Jana does not consider this to be a permanent move; only a temporary displacement. She intends to go back to school and finish her education once it is over.

6 am - Walk to get bread (25 minute walk, 20 in line)

7 am - Put away and fold bed and mattresses. Need more space in shelter for living..

7:15 am - Shower using a cold bucket of water behind the tent. Only get shower 2 times a week, need to hurry because people are waiting

7:30 am - brush hair and talk with her family

8 am - feed her youngest brother, 3, while eating breakfast

8:40 am - fetch water (need to fetch water 6 times a day). She is sore from carrying heavy buckets.

9 am - wash dishes behind tent. no hot water. dish-washing is done in a plastic bucket. they are never completely clean - always still a bit of sand.

10 am - take children out to play

11 am - walk 30 minutes to buy food using food vouchers (there is no refrigeration)

12:30 pm - cook lunch at the communal camp kitchen with 16 stoves. she must wait in line to cook, after carrying the ingredients from her tent to the kitchen, and then carry back after done cooking.

2:30 pm - eat lunch. they only get to eat meat on Fridays.

3:30 pm talk with relatives who also live in the camp. walk around and socialize with neighbors

5:30 pm - rare, short break between the many trips to get water.

### Pain Points

Need for increased social interaction

Water, bathrooms, and food are often too far away

Must provide dignity; refugees are not a burden

Houses and shelters must be durable, but temporary

Children often play during day without supervision

### Users / Markets

#### Refugee

NGO Business model

Funds come from donations from business for good PR and Tax benefits

Advertising and branding opportunities possible

#### Homeowner

Personal shelter for emergency use

Flatpacking allows for consumers to purchase and store in case of emergency

#### Homeless Shelter

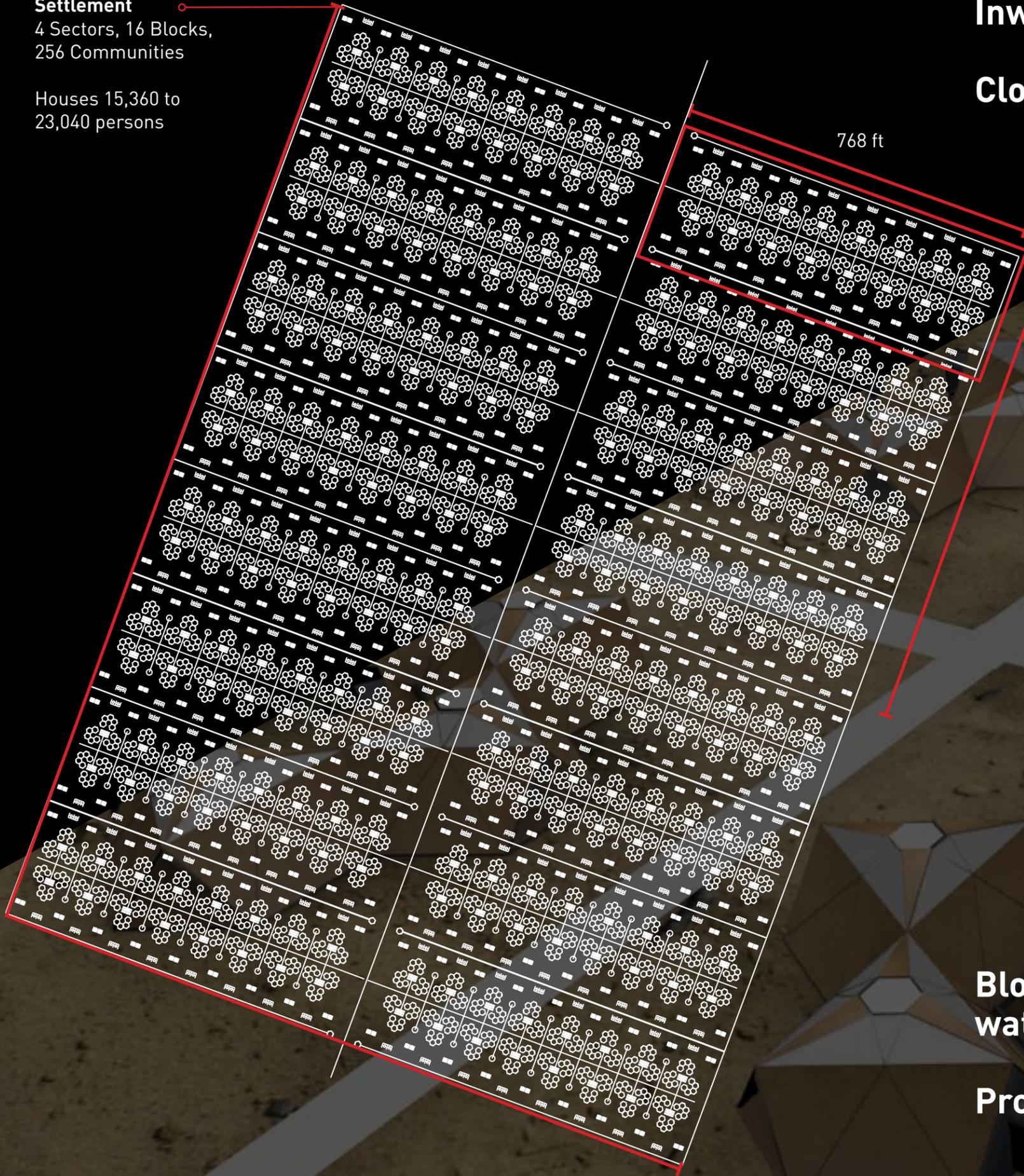
Purchase for use at a lower cost by philanthropic organizations

#### Possible Commercial Usage

Camping, temporary shelter, music festivals, etc

**Settlement**  
4 Sectors, 16 Blocks,  
256 Communities

Houses 15,360 to  
23,040 persons



**Inward facing arrangement encourage social interaction**

**Closed-off clustering protects & helps child supervision**

**Block**  
16 Communities, 240 Families  
Houses 960 to 1440 persons

**Single Family Unit**  
For Single Family use.  
Houses 4 to 6 persons

**Sector**  
4 Blocks, 64 Communities,  
960 Families, Houses 3840 to  
5760 persons

**Multiple Family Cluster**  
For up to 5 families  
Houses 20 to 30 persons

**Community Cluster**  
15 Families  
Houses 60 to 90 persons



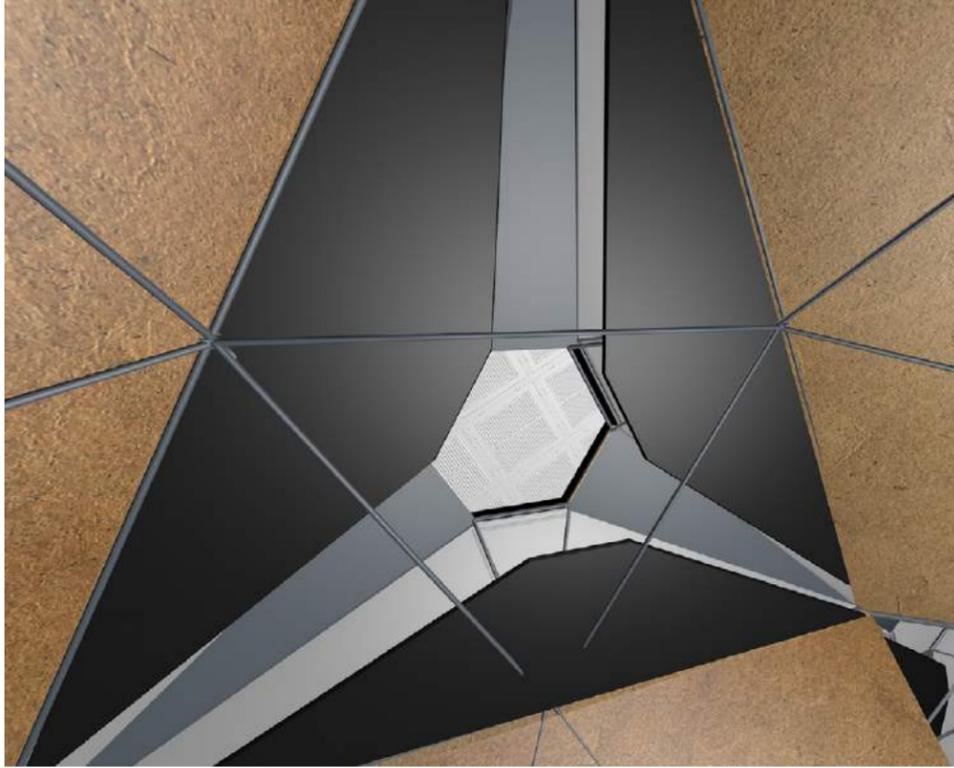
Shared cooking area in the center

Water and gas tanks pump into tubing along inner  
sides of cluster

**Block and sector arrangements facilitate quick  
water delivery to blocks**

**Provides security while still encouraging mingling**

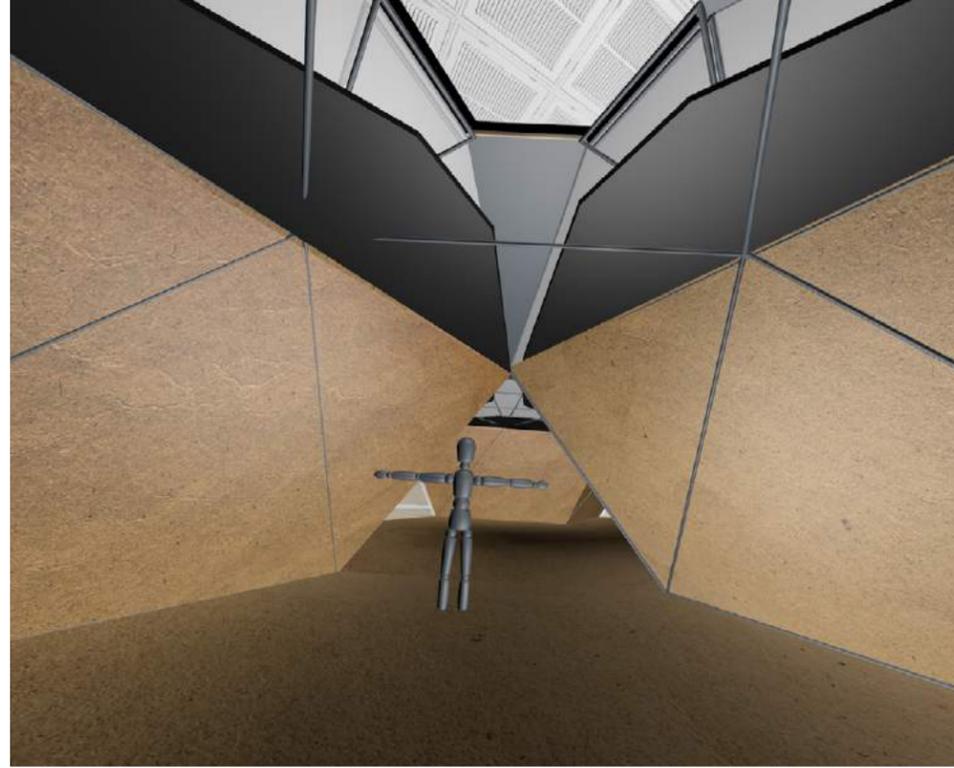
## Additional features



Solar panels can fold downward at night to trap heat and provide warmth

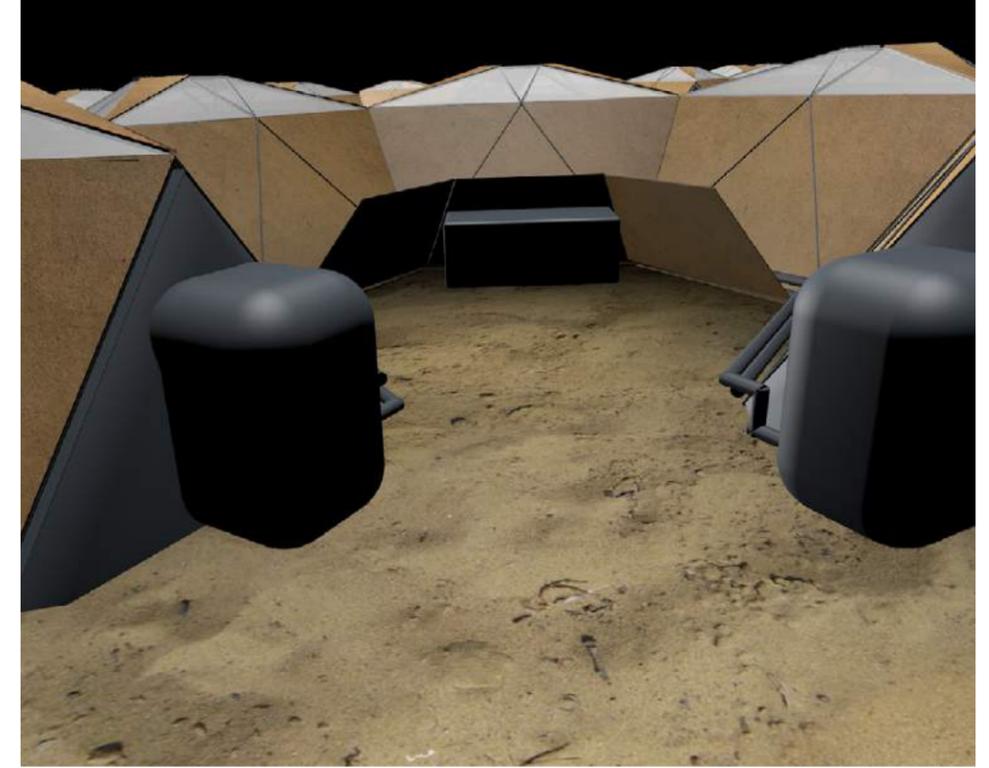
Top panel closes when not used for optimal parabolic solar cooking

Thin, strong beams allow for hanging of lamps or drying laundry



Approximately 7 to 8 feet vertical clearance

Entrances between family units may be opened or closed



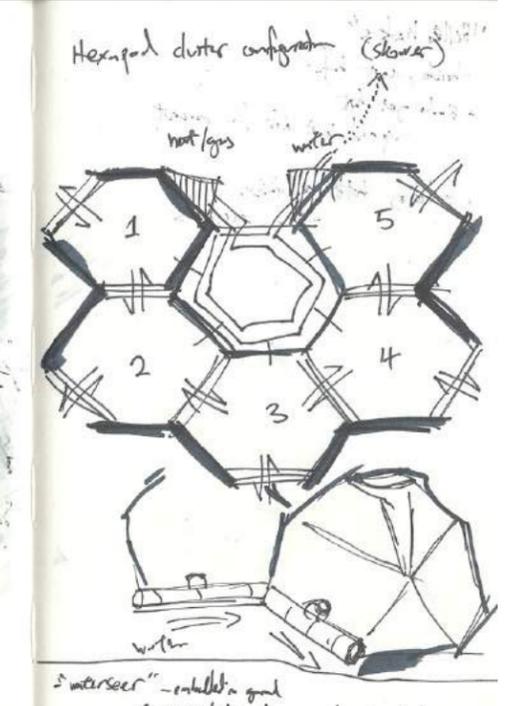
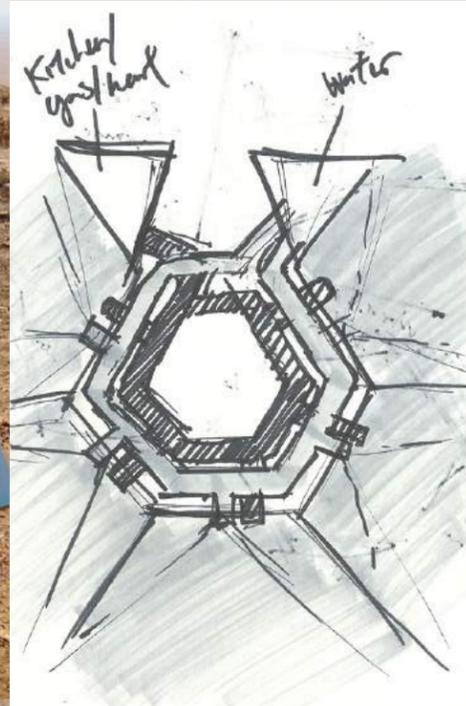
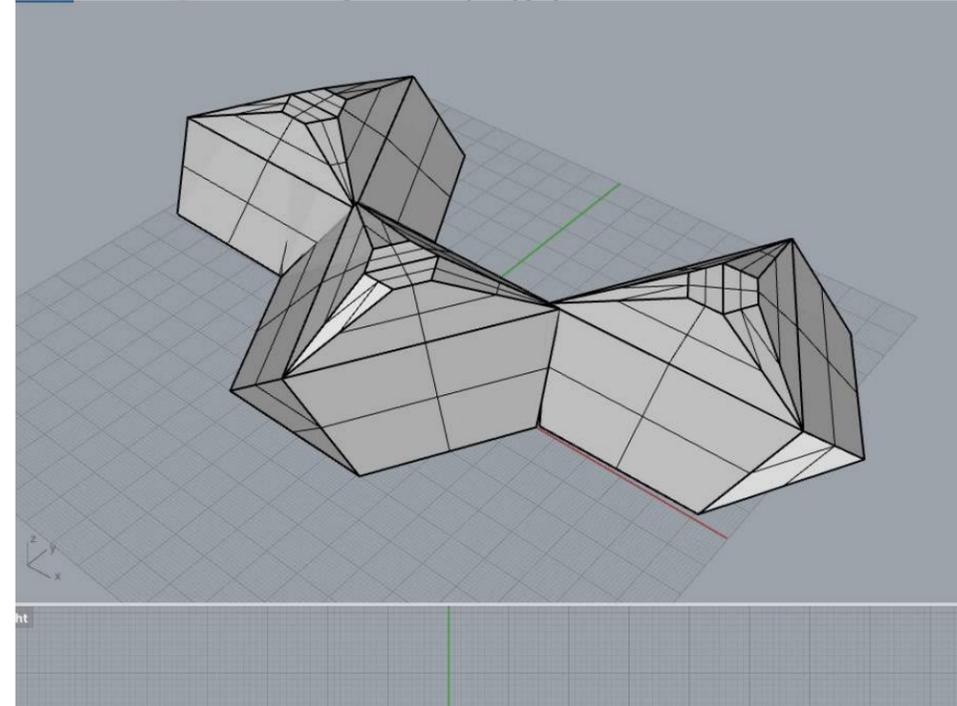
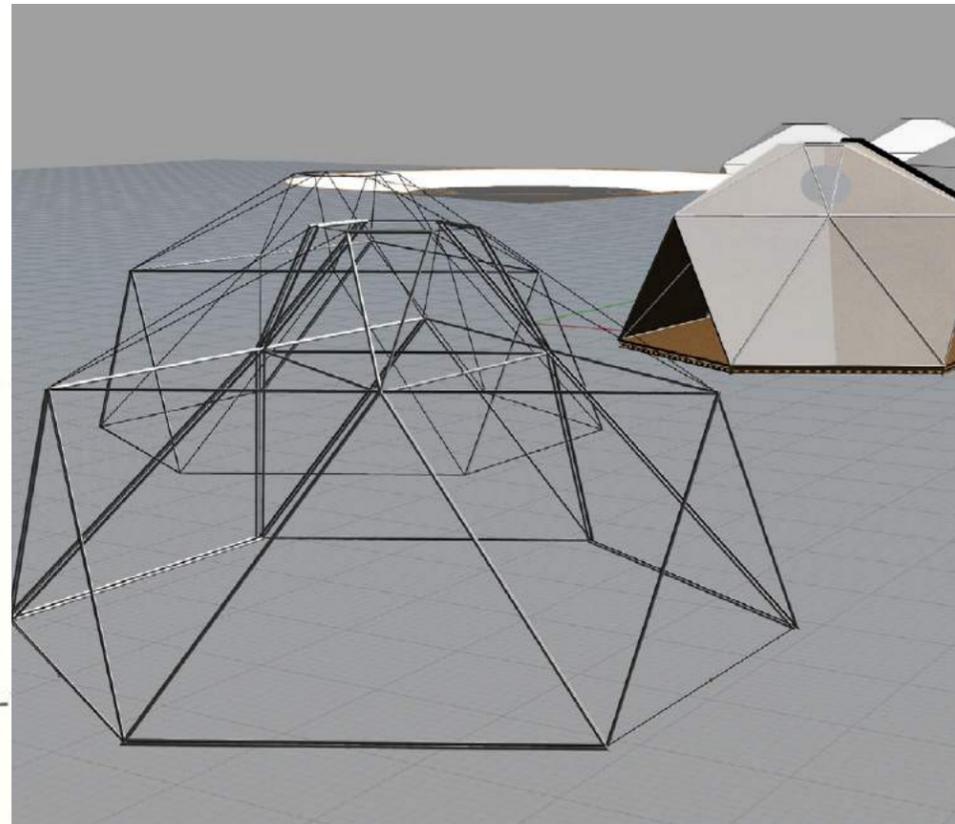
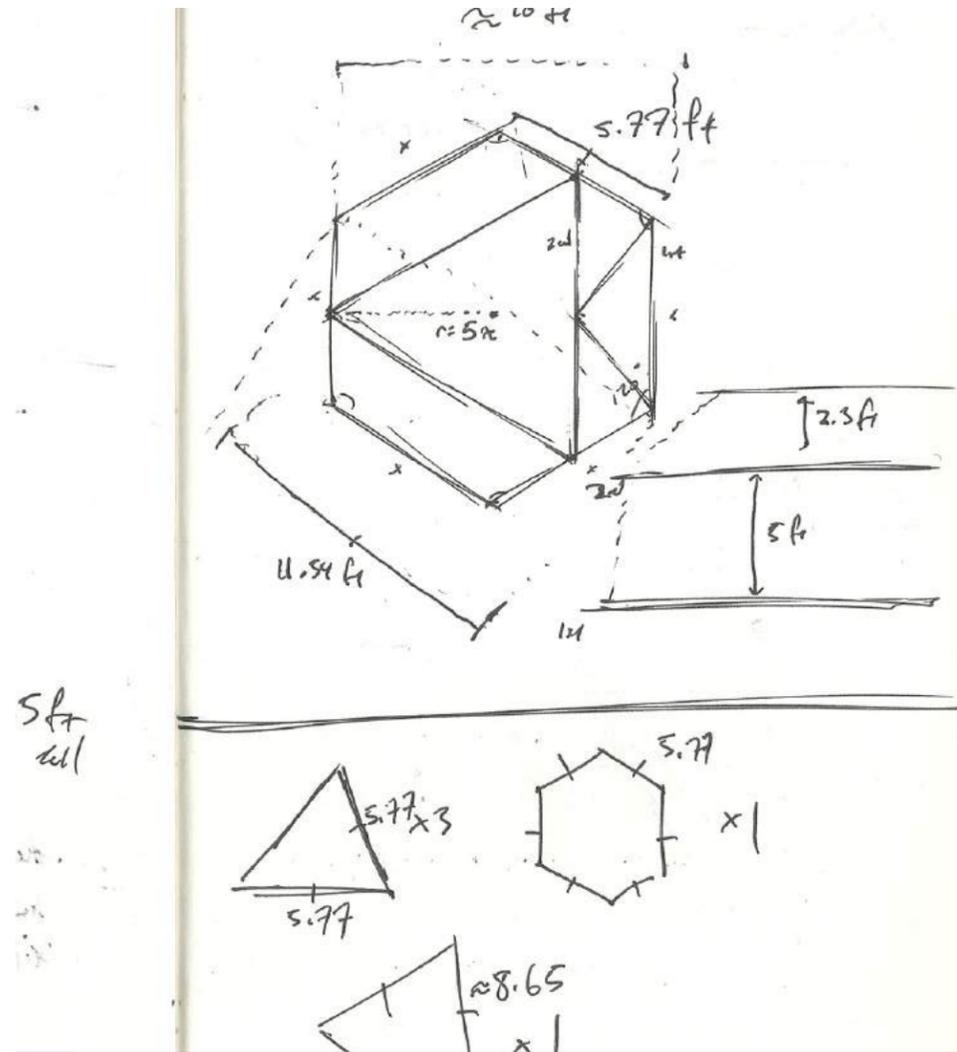
Gas & water travel through tubes fed into single family units

Communal cooking space in center dissipates excess heat into shelters

Water tank stores 6116.43 liters of water per multi family cluster

(203 liters per person, UN requires at least 20 liters per person per day)

# Process Documentation



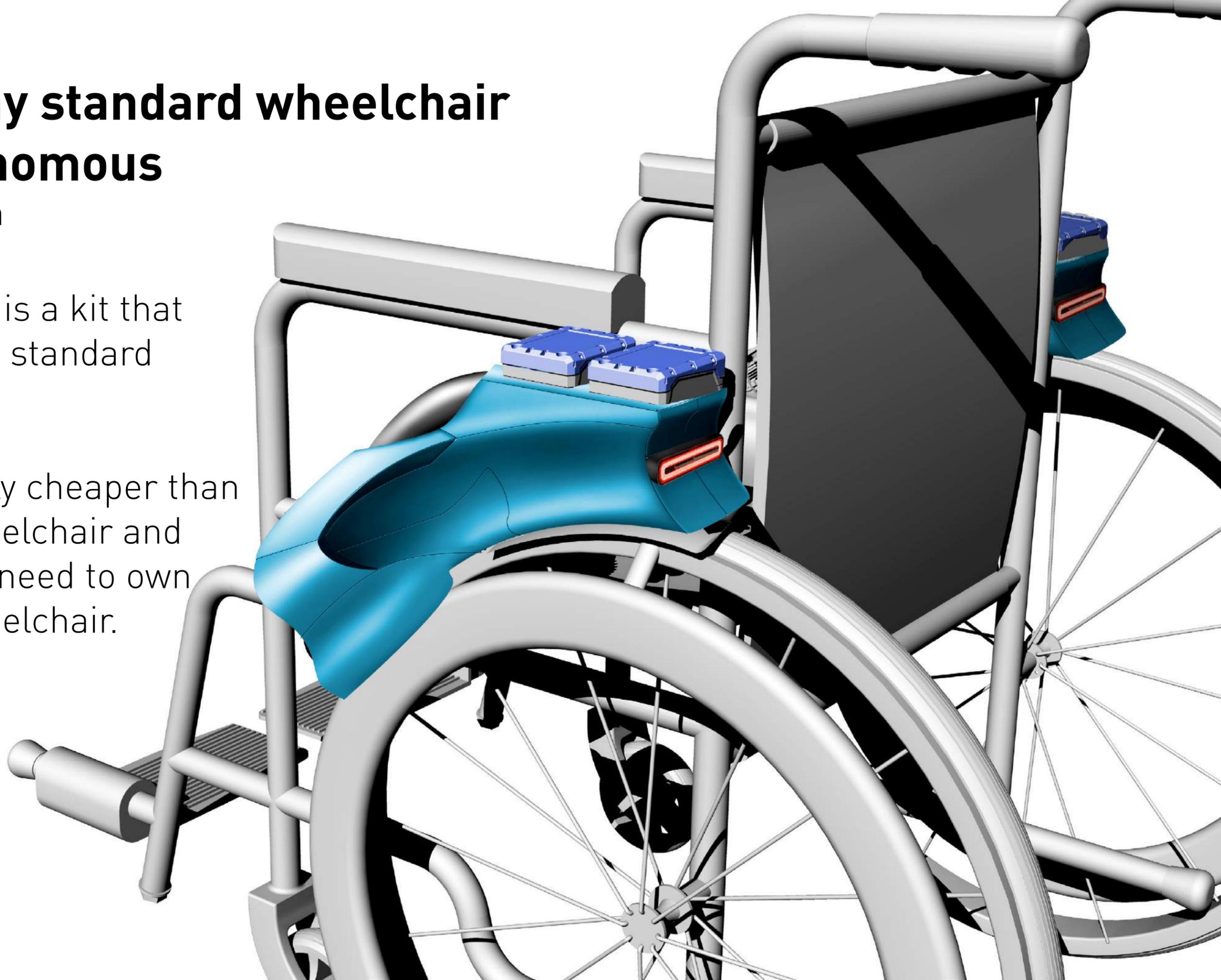
The Wingboost Motor

# Convert any standard wheelchair to be autonomous

Product Design

The Wingboost is a kit that attaches to any standard wheelchair.

It is significantly cheaper than an electric wheelchair and eliminates the need to own a separate wheelchair.



# 3.6 million

**Number of people 15 and older who used a wheelchair to assist with mobility. This compares with 11.6 million people who used a cane, crutches or walker.**

Source: Americans with Disabilities: 2010 [www.census.gov/prod/2012pubs/p70-131.pdf](http://www.census.gov/prod/2012pubs/p70-131.pdf)

# 12 million

**Number of people 15 and older who required the assistance of others in order to perform one or more activities of daily living.**

Source: Americans with Disabilities: 2010 [www.census.gov/prod/2012pubs/p70-131.pdf](http://www.census.gov/prod/2012pubs/p70-131.pdf)

# \$7,132

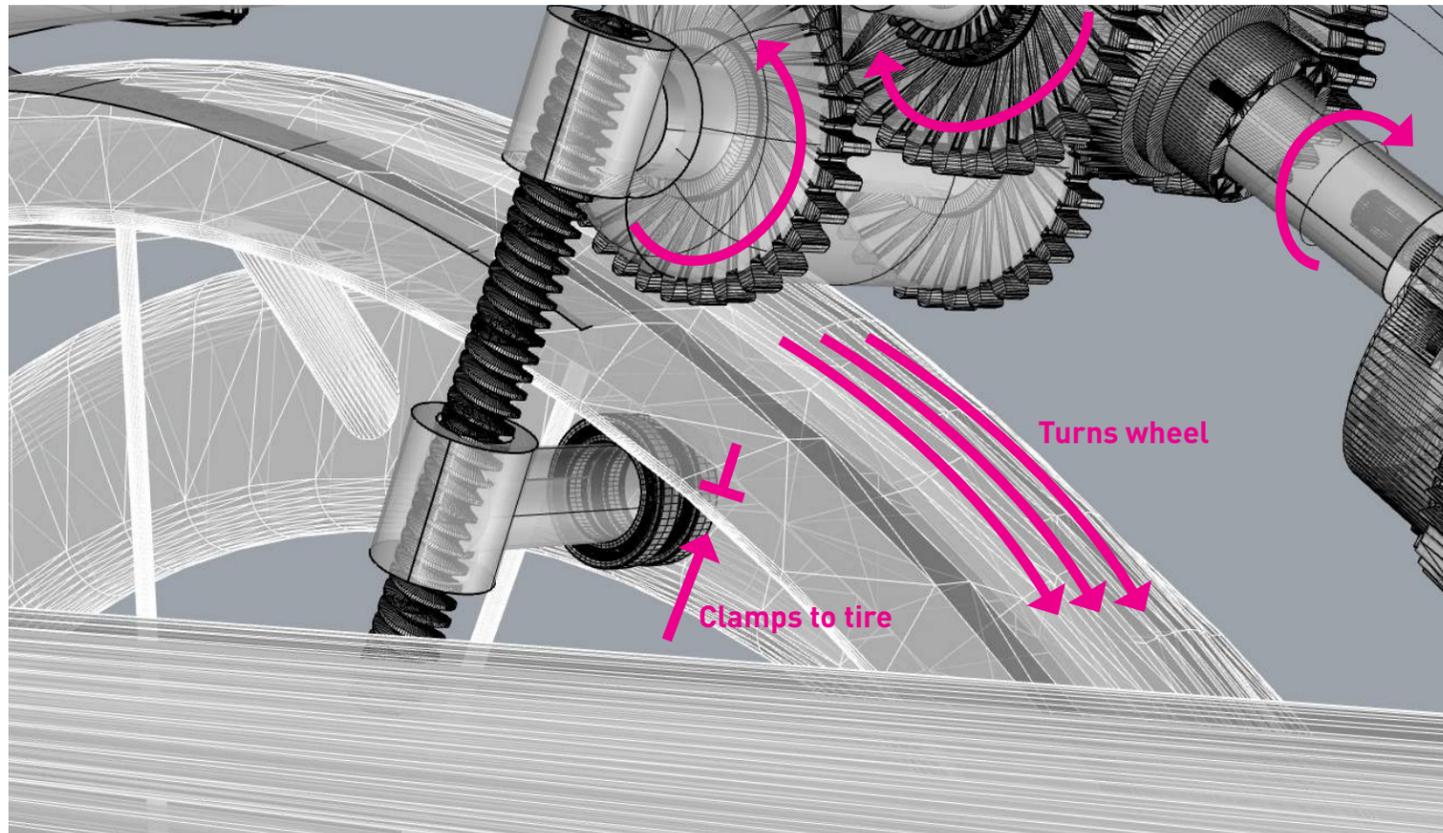
**Average cost of electric powered wheelchairs**

Archives of Physical Medicine and Rehabilitation

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**Problem:** Not every wheelchair user may have the upper body strength to push themselves comfortably all day. However, electric wheelchairs are still too expensive for the average user.

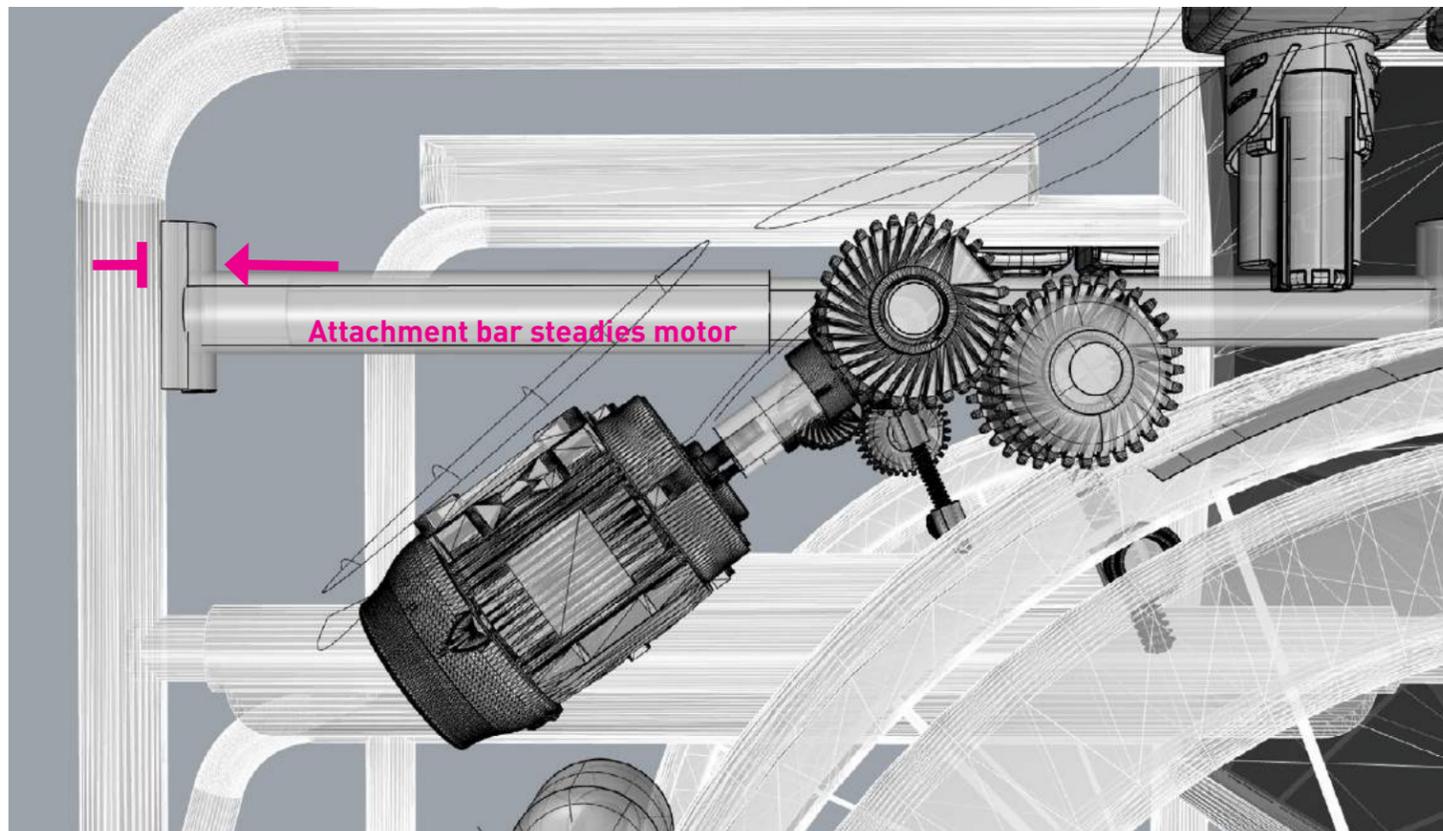
## How it works:



Miniature drive shaft clamps to top of wheel, on side facing occupant, creating friction drive.

Motor: Brushless gearless  
Power: 500W / 36V

Torque: 35 N.M



Motor, drive shaft, and double 18v battery packs (36v) fit into close, compact form.

Easy access by user.

# The Wingboost Motor Kit includes:



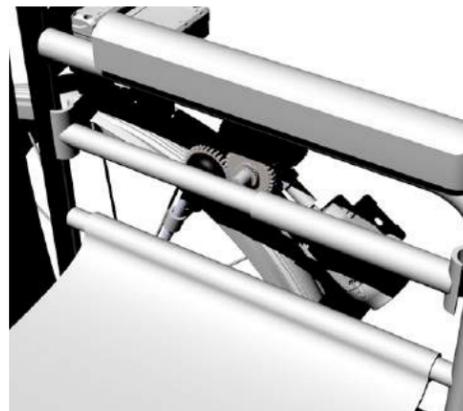
2x Ryobi 18-Volt ONE+ Lithium Ion Compact Battery 1.5Ah for Ryobi power drills



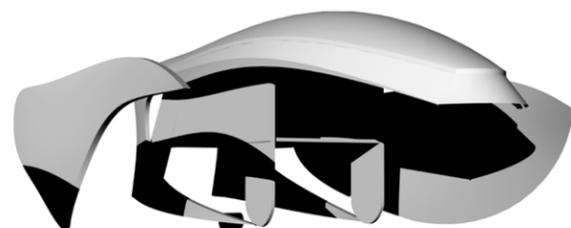
Custom mini drive shaft assembly made from machined 7075 aluminium alloy



36V/500W brushless gearless hub motor



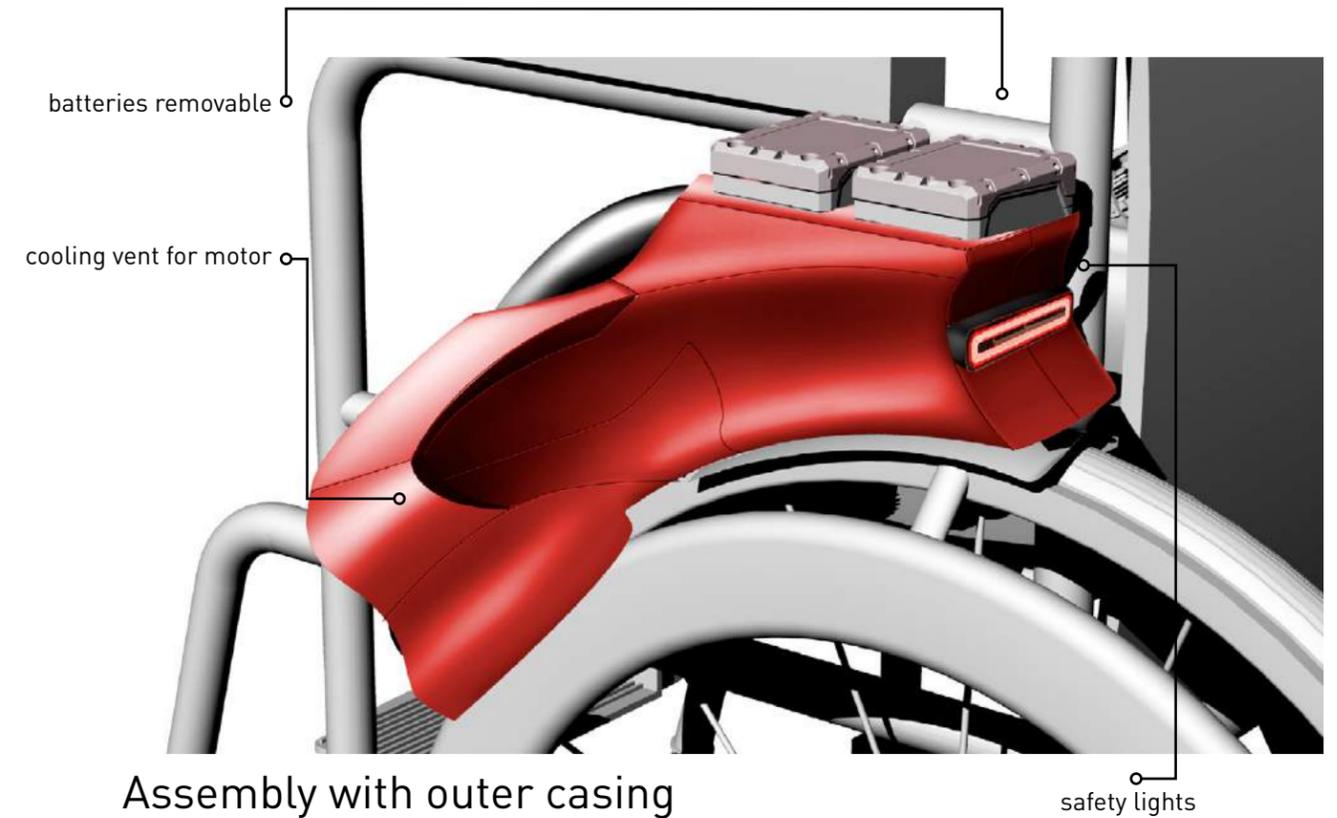
Adjustable attachment system



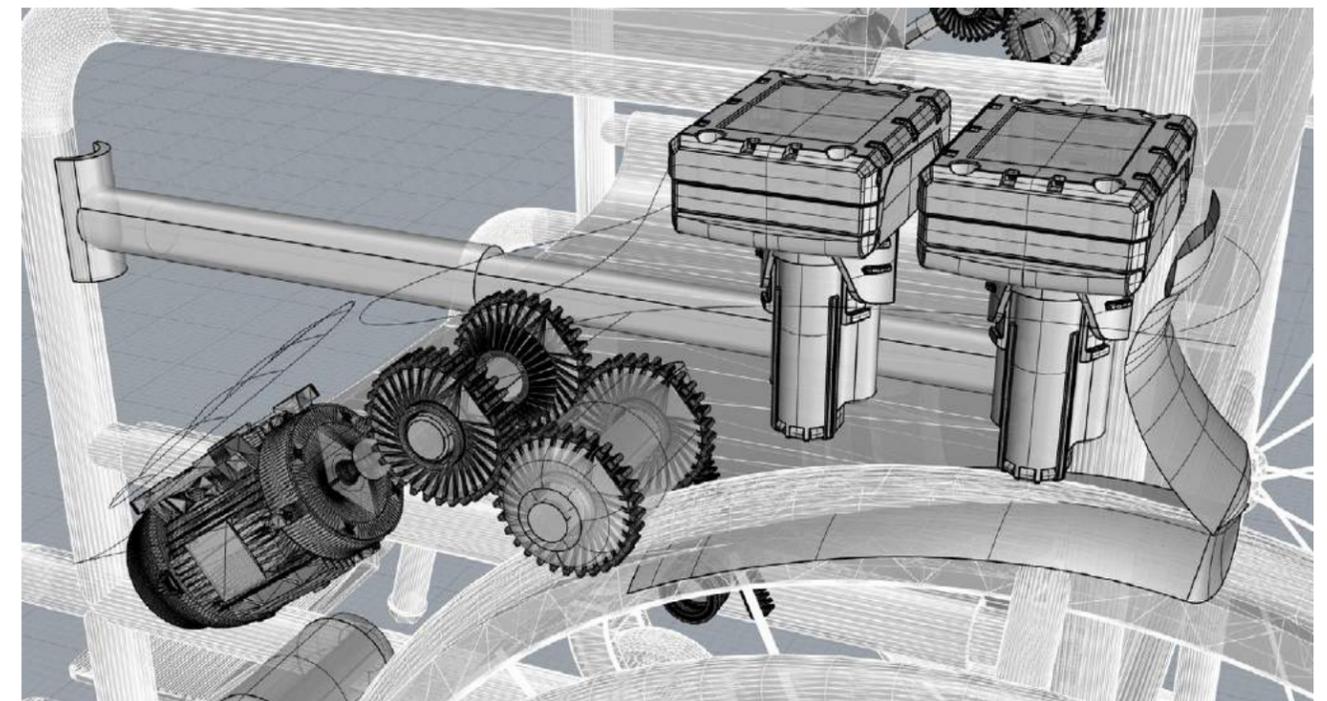
Outer casing made from injection molded ABS plastic, safety LED included



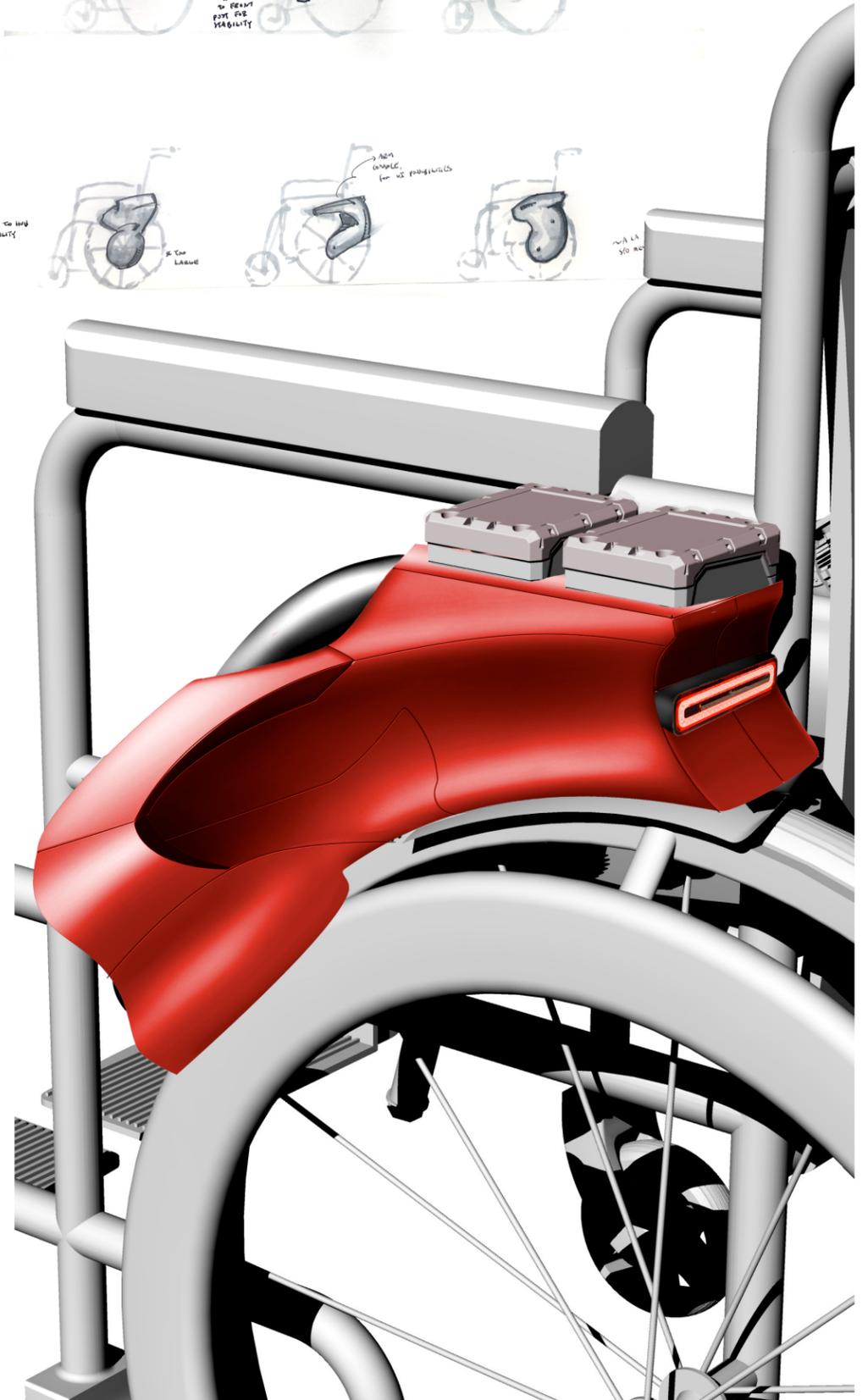
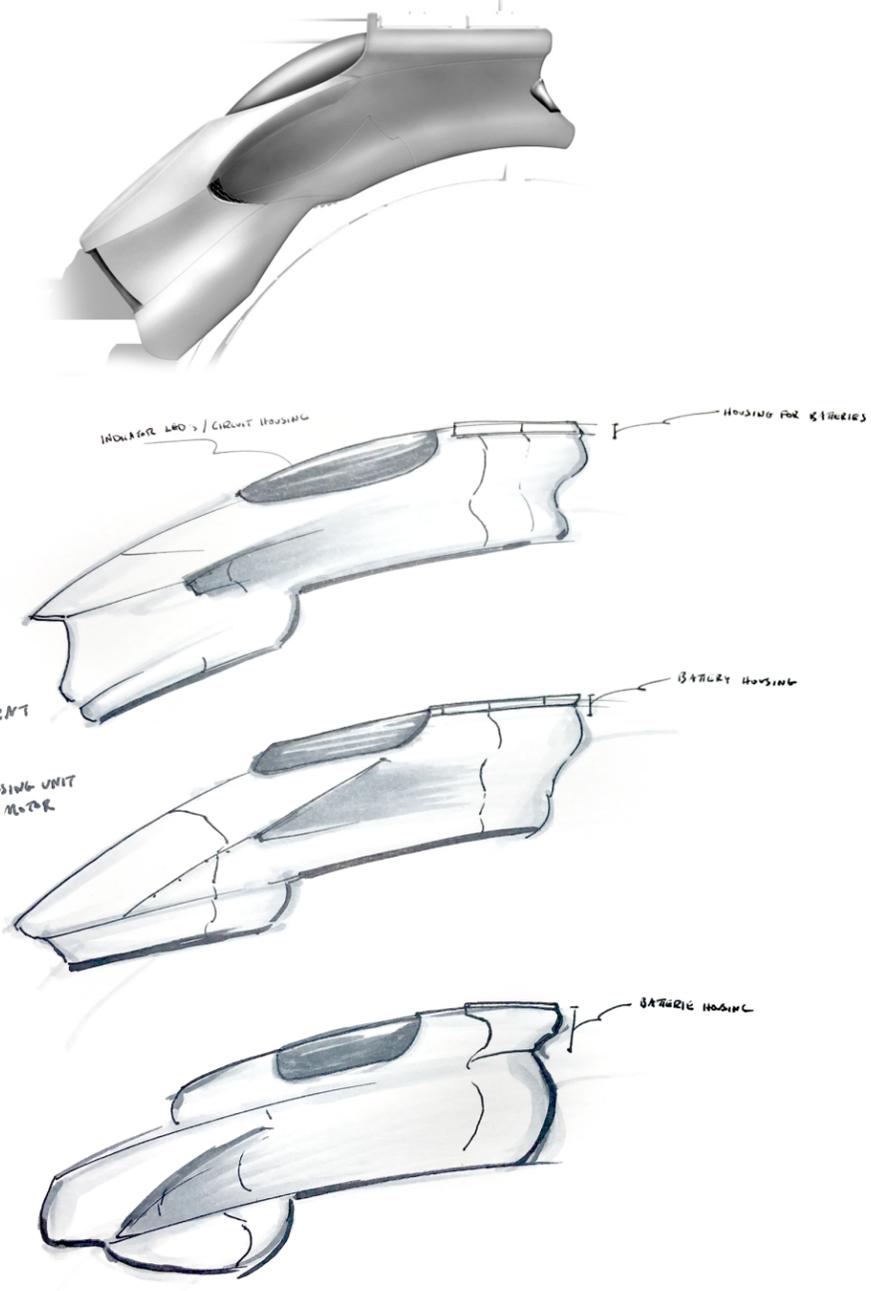
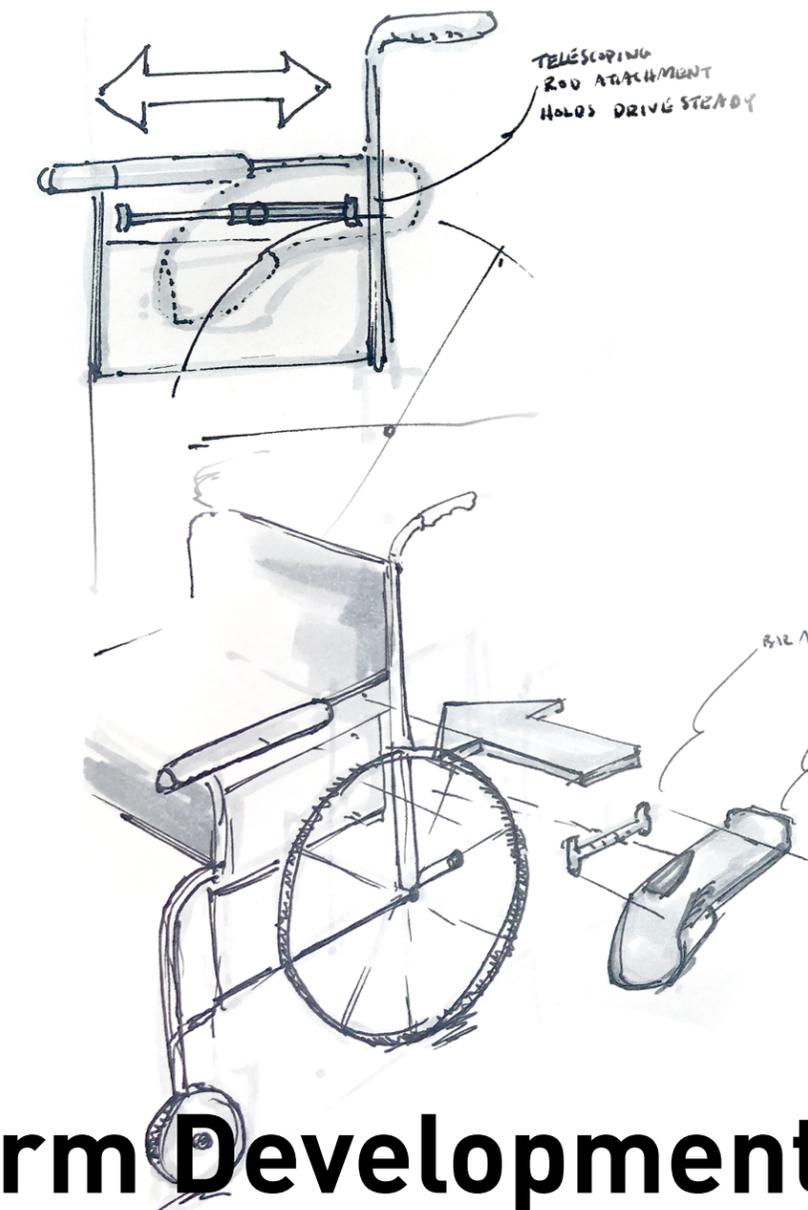
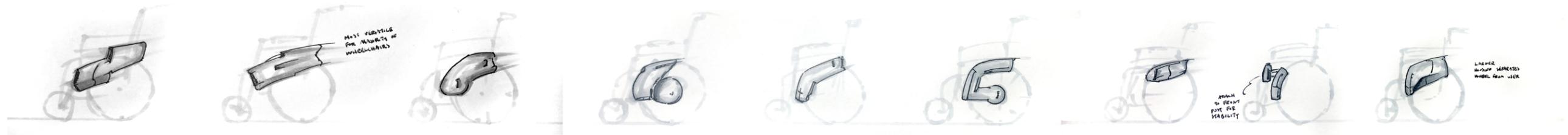
Raspberry Pi microcontroller programming included



Assembly with outer casing



Assembly without outer casing



# Form Development

# Business Model Canvas \*see Grad ID Essay

<p><b>Key Partners</b></p> <ul style="list-style-type: none"> <li>Ryobi Company</li> <li>Businesses to provide scrap material</li> <li>Manufacturers</li> </ul>	<p><b>Key Activities</b></p> <ul style="list-style-type: none"> <li>Use Ryobi batteries to create wheelchair kit</li> <li>Selling kit to consumers</li> <li>Recycling Scrap</li> <li>Donating 20% of material to make childrens eyeglasses</li> </ul> <p><b>Key Resources</b></p> <ul style="list-style-type: none"> <li>Recycling Plant (\$1M)</li> <li>Ryobi Batteries (\$35 per unit)</li> <li>Other business's scrap</li> <li>Patents</li> <li>Software</li> </ul>	<p><b>Value Propositions</b></p> <ul style="list-style-type: none"> <li>Low cost kit that easily converts manual wheelchairs to powered</li> <li>Customization and adaptability</li> <li>Free recycling service for other businesses</li> <li>Green / Humanitarian initiatives</li> </ul>	<p><b>Customer Relationships</b></p> <ul style="list-style-type: none"> <li>B2B repeat business, for recycled material</li> <li>Long term consumer relationship, parts replacements and customization</li> </ul> <p><b>Channels</b></p> <ul style="list-style-type: none"> <li>Health care providers</li> <li>Online Distribution</li> </ul>	<p><b>Customer Segments</b></p> <ul style="list-style-type: none"> <li>Younger disabled users age 16 - 35</li> <li>Older wheelchair users</li> <li>Family members of disabled individuals</li> <li>Business that want to cleanly dispose of trash</li> <li>Healthcare providers</li> </ul>
<p><b>Cost Structure</b></p> <ul style="list-style-type: none"> <li>Upfront costs of equipment and factories</li> <li>Costs of recycling and manufacturing</li> <li>Marketing and Advertising costs</li> <li>Employee Salaries</li> <li>Research and Development</li> </ul>		<p><b>Revenue Streams</b></p> <ul style="list-style-type: none"> <li>Subscription battery replacements</li> <li>Sales \$450 per unit</li> <li>Sponsorship from Ryobi</li> </ul>		

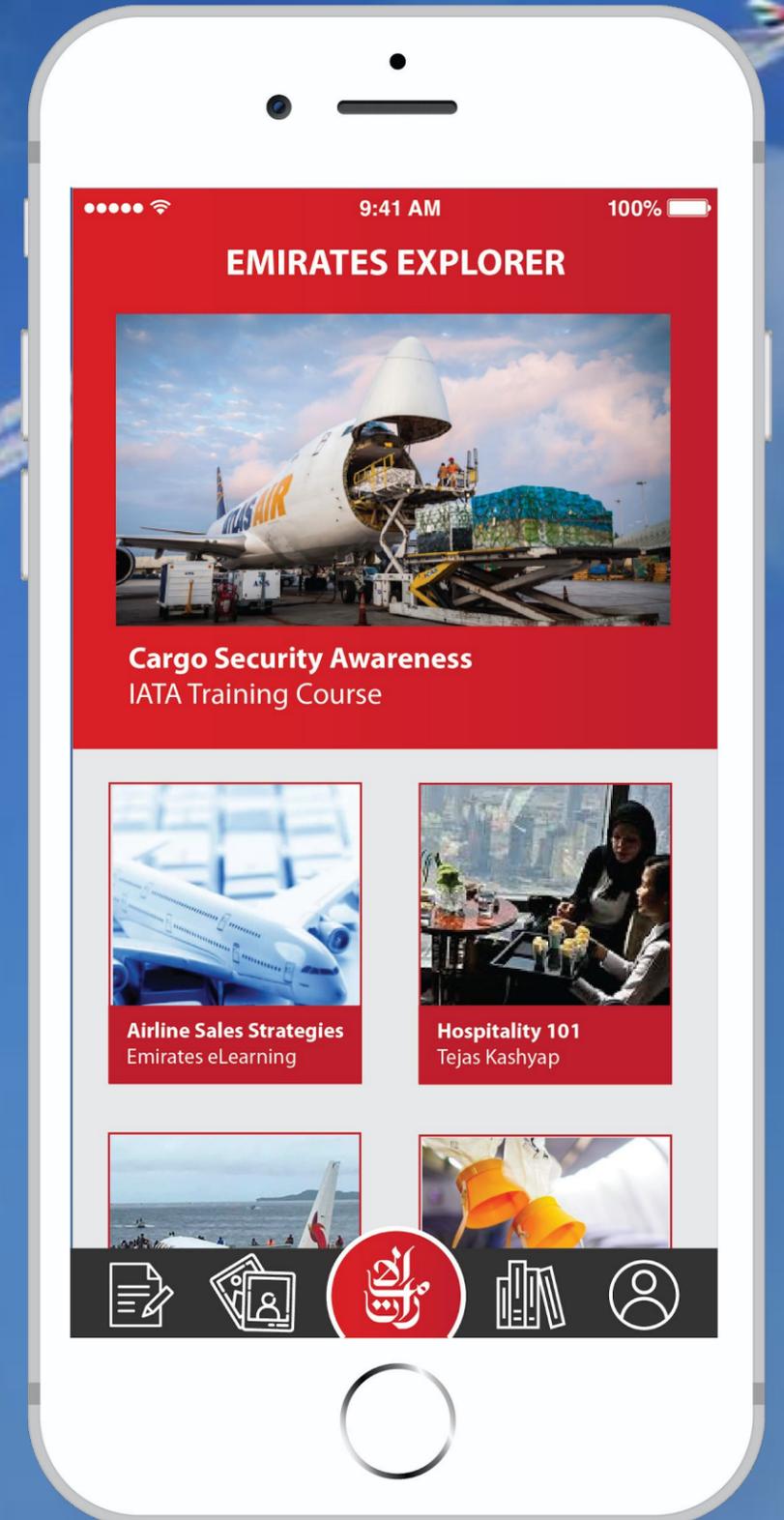


# Emirates Learning Management System

## Mobile Application

**My Role:** User Research, Secondary Research, Wireframing, UI Design

Robert Halvorsen | Brian Xiao | Tejas Kashyap | Xiaohan Wu





Emirates wants to help their employees through educational opportunities. However, employees feel that their most pressing concerns are ignored and silenced when brought to the attention of their management.



Anna Genevieve Louise (Actual Person)

## “What It's Really Like to Work as Emirates Cabin Crew, From a Former Employee”

<https://www.popsugar.com/smart-living/Emirates-Flight-Attendant-Secrets-43709242>

### Gain Points

- Going to far away places for free
- Feeling like part of a family
- Living in Dubai for free
- Friends from all over the world
- Staying in amazing hotels
- Tax-free salary
- Glamor / Excitement

### Pain Points

- Being away from family and friends
- Missing holidays and family events
- Dealing with jet lag and health issues
- Having passengers yell at you for things out of your control
- Being looked at all the time for your appearance,
- Dealing with delays on flights
- Waking up at any hour during the day or night for flights

“Eventually, I did start to miss many things about being crew. ...it was the sense of **camaraderie** I felt with the crew. I missed being so tired on long-haul flights that we'd all sit around in the galley deliriously giggling and telling jokes to stay awake.”

**KNOWLEDGE**

**MAINTENANCE**

**(PREVENTS GETTING RUSTY/ FORGETTING)**

**POINTS APPLIED**

**TOWARDS**

**PROMOTION/**

**ADVANCEMENT**

**CONTENT TYPES**

Daily mini quizzes

Safety check flashcards

User generated content

Articles / skillshare

Emirates generated articles

Full courses

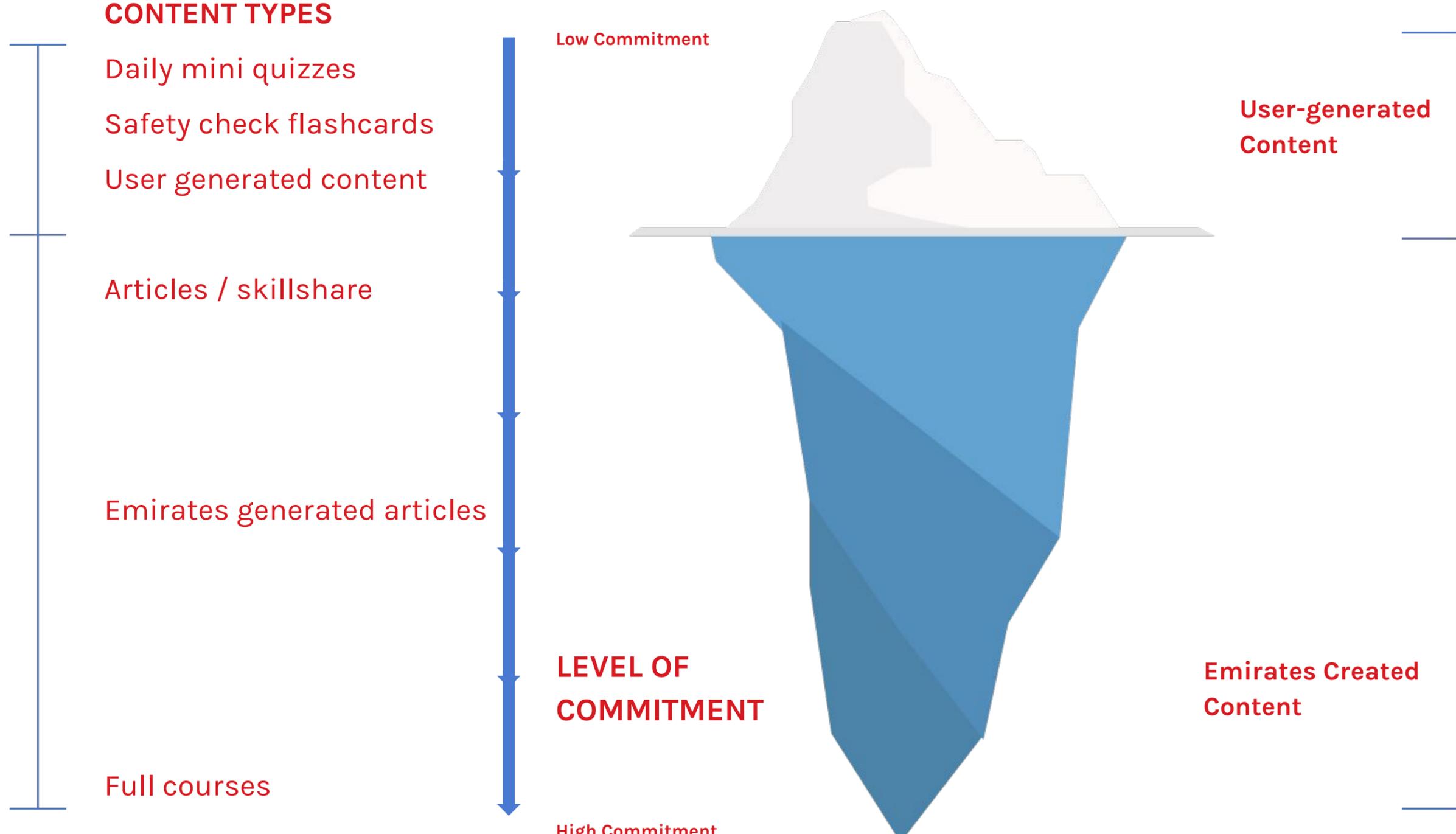
Low Commitment

**LEVEL OF COMMITMENT**

High Commitment

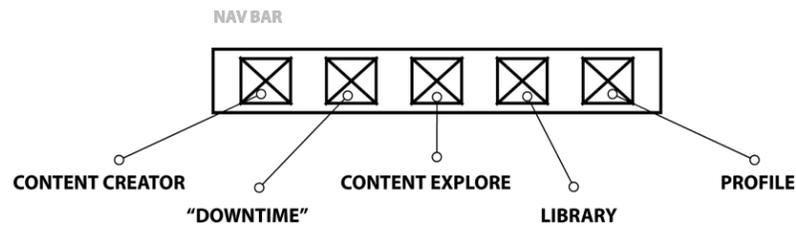
**User-generated Content**

**Emirates Created Content**



# Wireframes

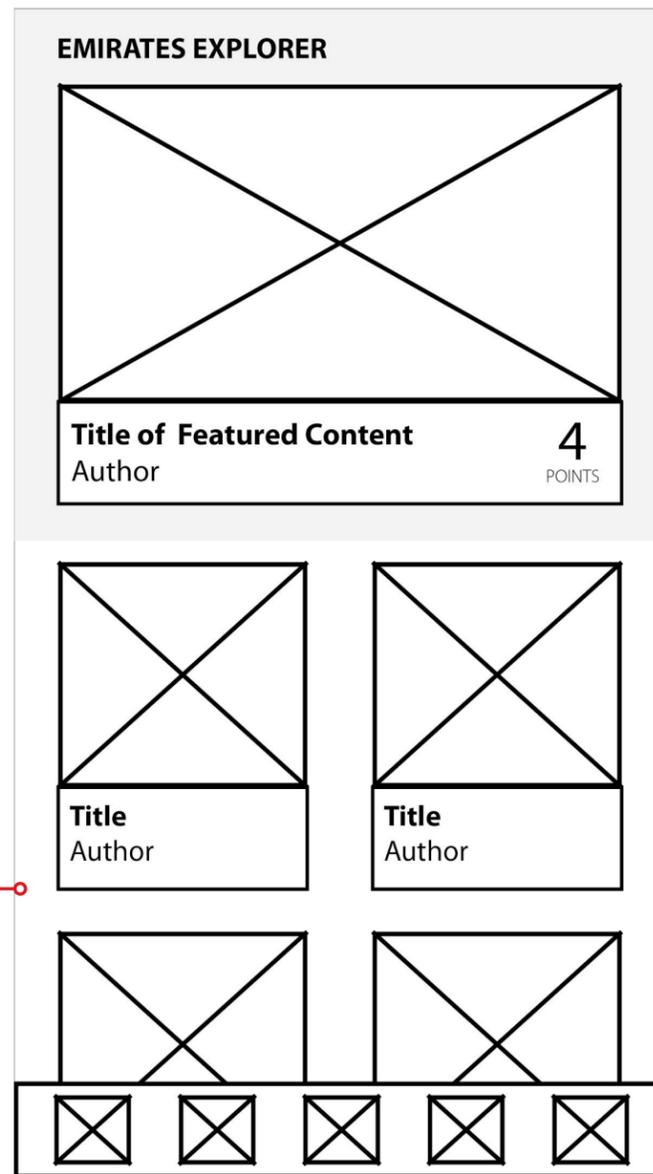
## Landing Pages



Navigation is located on the bottom and takes user to landing pages of five parts of the app

The Content Explorer is an immersive hub for the user to look at courses, articles, blogs, or tips from other employees

CONTENT EXPLORATION LANDING



LIBRARY LANDING



The Library is the location where the user can save pieces of content she enjoys, to watch later, or view her own history.

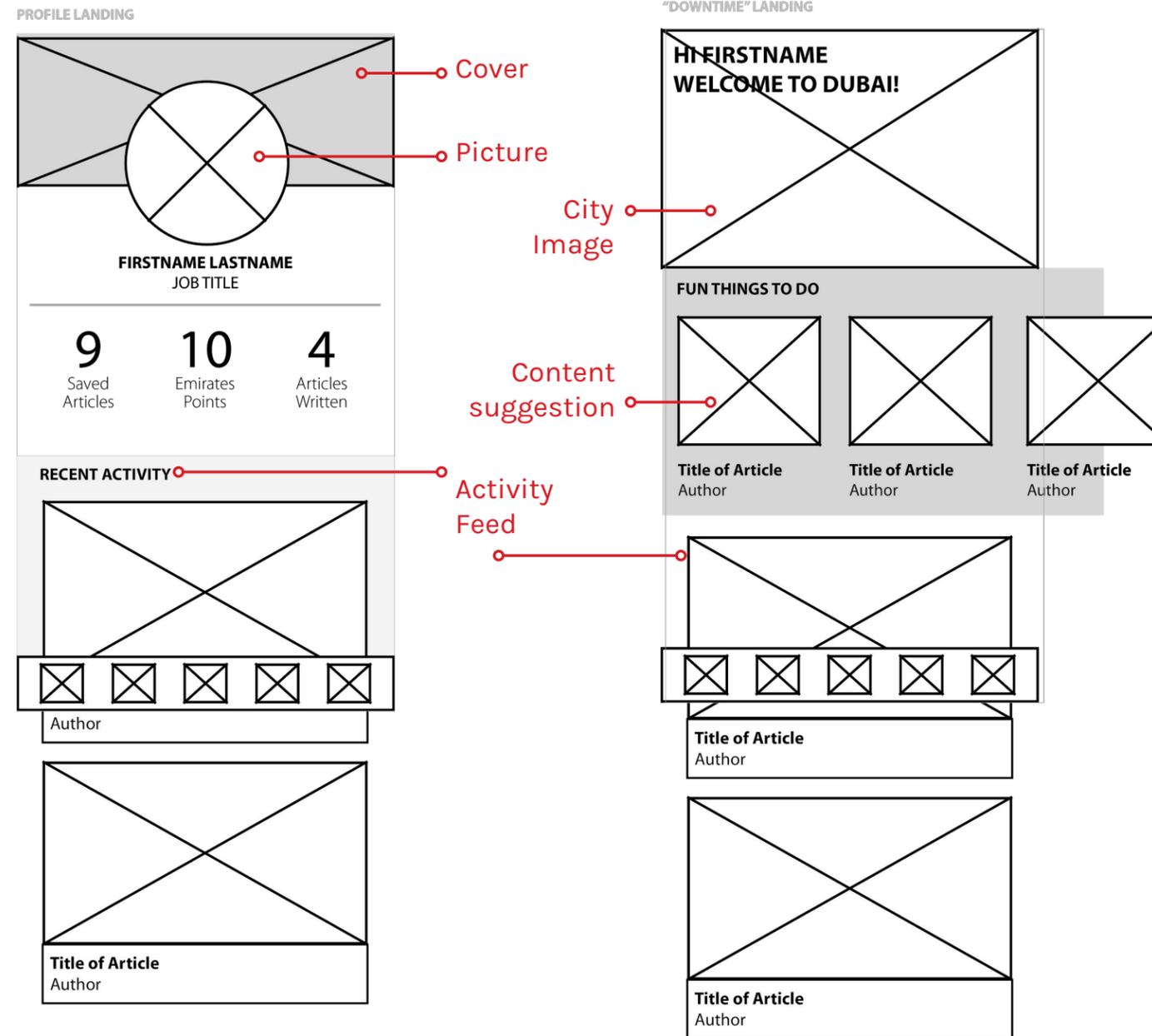
It is also a place for the user to keep personal files such as drafts, documents, or flashcards for study

# Wireframes

## Landing Pages

The profile page is an aspect of the app that leverages employee camaraderie and allows for personal expression.

Like other social media apps, it allows for cover photos and blogging in addition to content curation



The “Downtime” feature of the app allows for usage during layovers for Flight Attendants.

Inspired by Yelp, this part of the app curates content depending on location data.

It gives suggestions of restaurants, fun activities, and nightlife through tips and articles made by fellow Emirates Flight Attendants

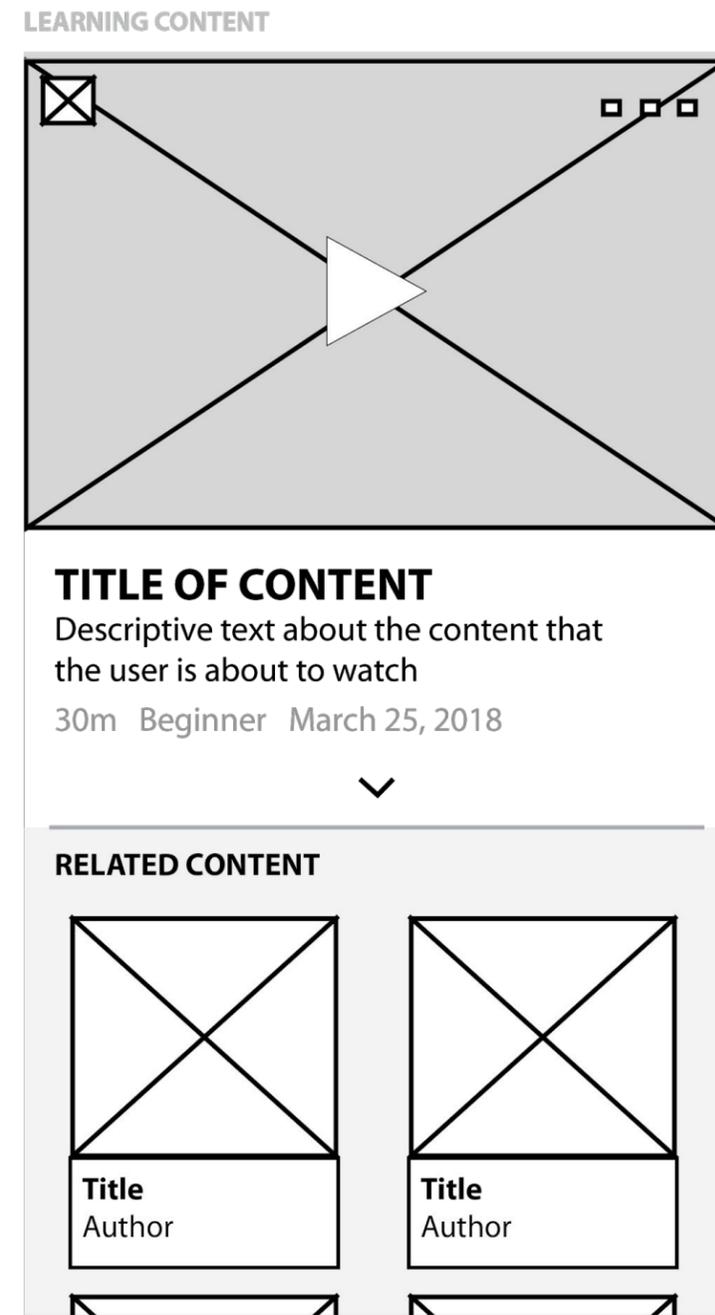
## Wireframes

### Content Page Examples

Here shows two examples of content pages: course content and article content

Course content is in a video format. However, a user may swipe down to reveal the written transcript of the lesson.

Additionally, the app also suggests related courses that the user may browse if interested



Article contents are more common and varied than courses; for ease of reading, the article fullscreens above the navigation panel.

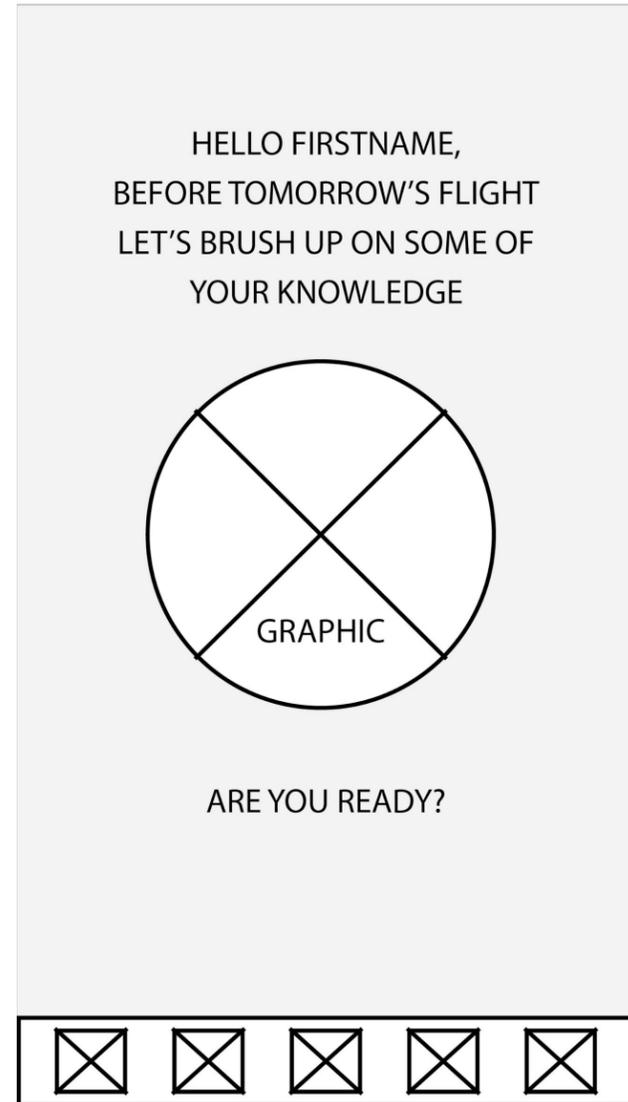
However, returning to the content explorer is as easy as swiping up from the bottom of the screen, or pressing the X in the top left corner



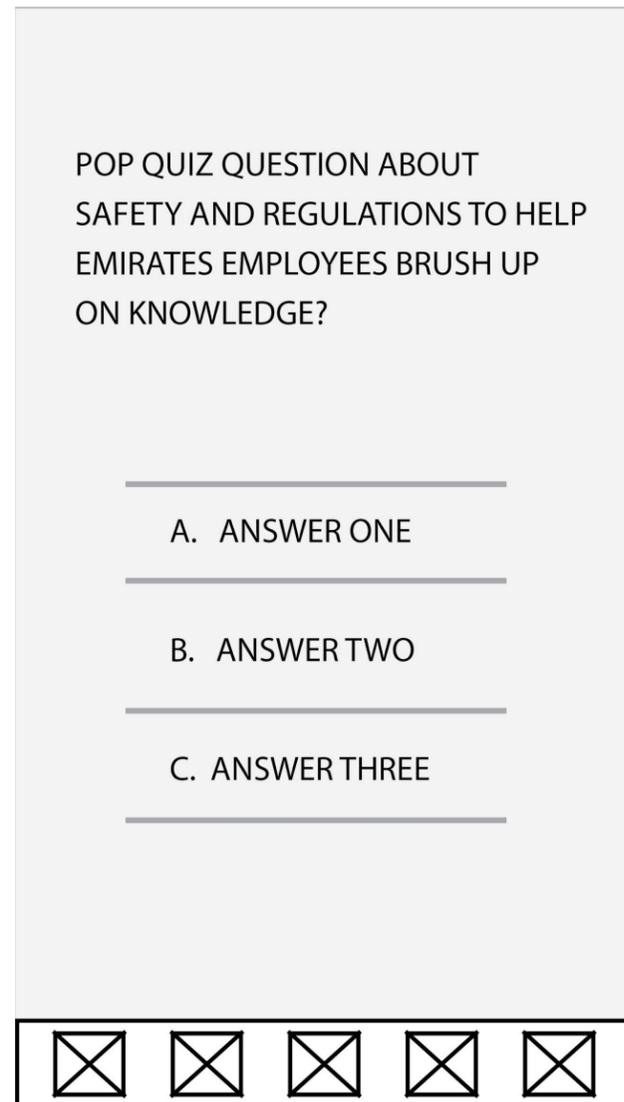
# Wireframes

## Pre-Flight Quiz Interaction Flow

PRE-FLIGHT QUIZ



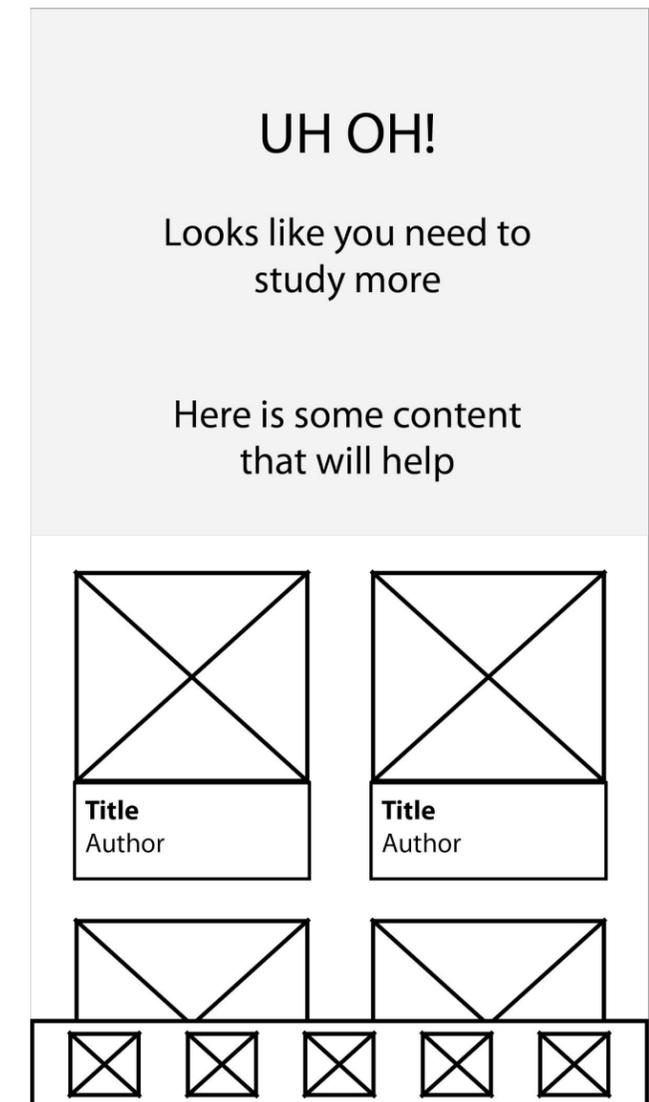
POP QUIZ



CORRECT ANSWER



INCORRECT ANSWER



Swipe Right

Correct

Incorrect

## UI Mockup

### Explorer & Downtime Landing Screens

UI examples shows a way in which brand would reflect Emirates branding and create an immersive experience for Employee eLearning

