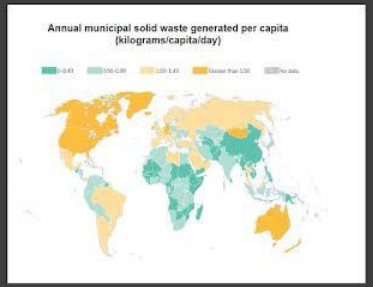
Trash in Landfills

Jasmine Fan

Portfolio

Brainstorm



https://datatopics.worldbank.org/what-a-waste/

Landfills are the most common way of disposing waste, according to the 5th World Convention on Recycling and Waste Management.

https://www.omicsonline.org/conferences-list/waste-disposal-practices

Landfills are the most common way of disposing waste, according to the 5th World Convention on Recycling and Waste Management.

Waste generation is increasing at a rapid rate (ex: cities are generating 80% more waste than the world's GDP).

2.01 billion tons of waste are generated annually, with 33% of that not disposed of in a environmentally safe manner.

https://www.worldbank.org/en/news/immersive-story/2018/09/20/what-a-waste-an-updated-look-into-the-future-of-solid-waste-management

Project Background

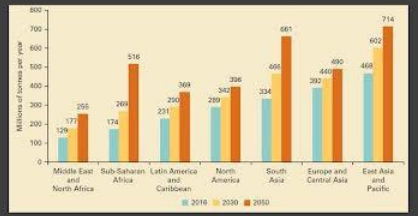
Inspiration Collage

Collage Description

On the beach, you see seagulls eat bits of colorful plastic. On your plate you see crabs with stomachs full of rubber bands. In your mirror, you see streams of red irritating your eye. We can't ignore the trash we throw away anymore. We'll fix this problem with step one, tackling landfills and their negative effects.

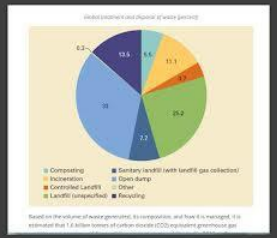
Monochrome gray images are used in the collage to express how grave of a danger they are to the environment, people, and animals, and when you go to the beach, you see seagulls consume trash, thus why they are added to the collage.

Research



Throwing trash in landfills is one of the most common ways to dispose of trash.

In 2016, 1.6 billion tons of carbon dioxide (greenhouse gas equivalent) was generated through solid waste disposal and treatment.



2.01 billion tons of waste are generated annually, with 33% of that not disposed of in a environmentally safe manner.

https://datatopics.worldbank.org/what-a-waste/trends_in_solid_waste_management.html

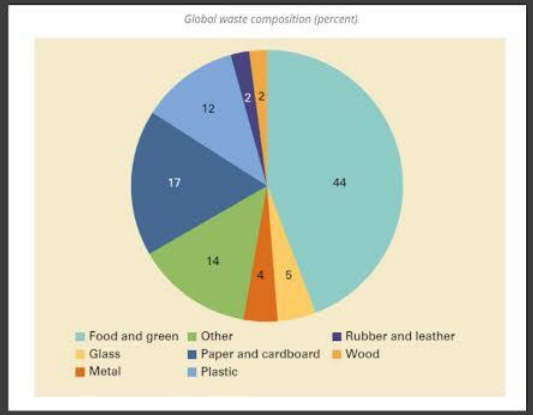
Research

Food and greens are the most disposed of waste.

Negative effects of poorly managed waste (general public):

Clog drains
Transmit diseases
Increase respiratory problems
Harm animals (consumption of waste)
Affect economic development (ex: tourism)

https://www.worldbank.org/en/news/immersive-story/2018/09/20/what-a-waste-an-updated-look-into-the-future-of-solid-waste-management



https://datatopics.worldbank.org/what-a-waste/trends_in_solid_waste_management.html

Negative effects:

Leaches into soil and groundwater
Ex: electronic waste

Generates leachate:

Pollute land, groundwater, and waterways

Produces methane:

Methane is a greenhouse gas 25% more potent than carbon dioxide, which contributes to climate change and global warming

Landfills breakdown at a very slow rate due to little/ no oxygen for decomposition:

Causes an overflow of trash in landfills

Negative effects on children:

High lead exposure

Elevated blood lead levels

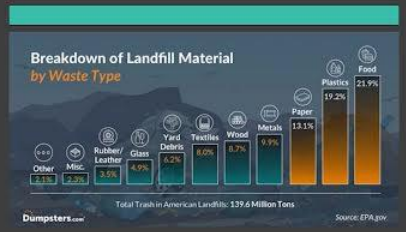
High risk of encephalopathy (altering of brain function/ structure) (affects education/ learning)

Death
https://pubmed.ncbi.nlm.nih.gov/26879806/

Negative effects on humans:

Eye/throat/lung irritation
Nausea
Headache
Nasal blockage
Difficulty sleeping
Weight loss
Chest pain
Aggravation of asthma

https://www.health.ny.gov/environmental/outdoors/air/landfill_gas.htm#:~:text=The%20reported%20health%20complaints%20included,with%20exposure%20to%20hydrogen%20sulfide[i]



Garbage thrown in landfills:
https://www.dumpsters.com/blog/us-trash-production

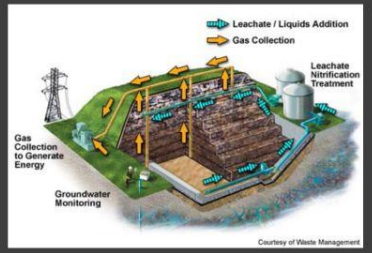
How long it takes for specific trash to decompose:
https://thisisplastics.com/environment/things-you-might-not-know-about-landfills/

Negative effect photos:

https://www.wiego.org/blog/open-dump-dilemma-how-help-environment-and-respect-human-rights

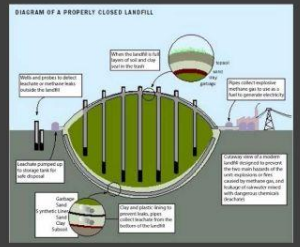
https://www.washingtonpost.com/graphics/2017/world/global-waste/

Research



Landfill Leachate Treatment:

https://www.geoengineer.org/education/web-class-projects/cee-549-geoenvironmental-engineering-fall-2017/assignments/landfill-leachate-treatment



Properly Closed Landfill:

https://www.epa.gov/landfills/municipal-solid-waste-landfills

Field Research

Landfills are usually located in open space or recreational areas in UK, China, Thailand, Vietnam, Indonesia (may also end up in illegal dump sites)

https://www.waste360.com/mag/waste_evaluating_potential_sanitary
https://youtu.be/oKLOVUZxlmI

Waste treatment process: **How trash gets to a landfill:**

Treatment at a landfill:

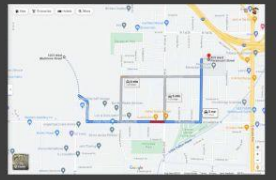
https://www.youtube.com/watch?v=Wzo5sv4lrlw

https://youtu.be/oKLOVUZxlmI
4:39- 4:51 5:13- 5:29 6:28- 7:11

Home trash -> garbage truck -> garbage transfer station -> given destination (ex: other country or in country (recycling, burning, landfill)

Field research

All photos from Google Maps unless stated otherwise



Paramount Elementary School is 1.2 miles away from Azusa Landfill. While the landfill is constantly managed, this can create problems in the future once the landfill is full and is less monitored.

https://www.schollcanyonlandfill.org/single-post/2016/05/25/setting-the-record-straight-scholl-canyon-landfill-power-project-and-more

The Scholl Canyon Landfill is 0.87 miles away from residential area. It is also used as a recreational area, with golf courts, parks, and hiking trails. It has the same risks as Azusa Landfill.

User Research

Interview + User Persona
Interview Questions:

1: What are some solutions you could think of to solve this problem?/ How should we treat this problem?

2: How do you think toxic landfills would affect you if you lived near one? Who would you blame the problem on? City management, parents, government, or other institutions?

3: How would you think this would affect your education/ school life/ work if you lived near a landfill?

https://servicedesigntools.org/tools/personas

Interview

We don't live near a landfill, but if we did...

Lilian:
Thinking:

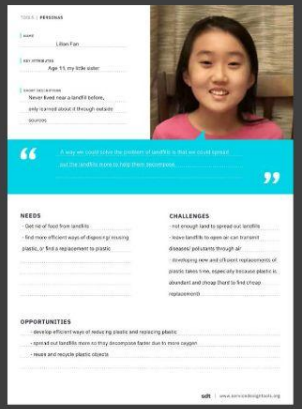
1 Spread out landfills more so they have more oxygen so they decompose faster

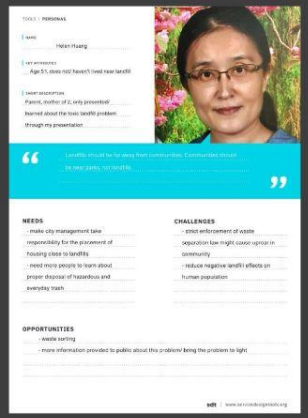
a Reuse and recycle plastic objects

2 Probably be very sick if lived next to a landfill
a Would say that it's the city's management problem for letting a landfill be next to residential area

3Would do worse in school

a Would feel unaccomplished and conflicted





My mother:

Thinking:

1 Waste sorting is a common/ important solution
2 Of course there will be effects living close to a landfill:

a Toxic gas affects health
b Irritates mucous membrane of eyes
c Disrupts health
d Blame on city management because they are in control

3 Affect work:

a Pollution in air
b Affect research results
Cannot guarantee accurate results

a Develop diseases

Lera:

Thinking and Personal Experience:

1 Cannot force everyone in the world to only recycle, it's very hard to find a solution to this problem

2 Would definitely affect her in a negative way because she is exposed to landfill burnings right outside her window

a Would blame government for toxic landfill problems because they should do something about the problem, but they decide to not do anything about it

3 Adapted to school life living near landfills in Ukraine

Identified problems from interviews:

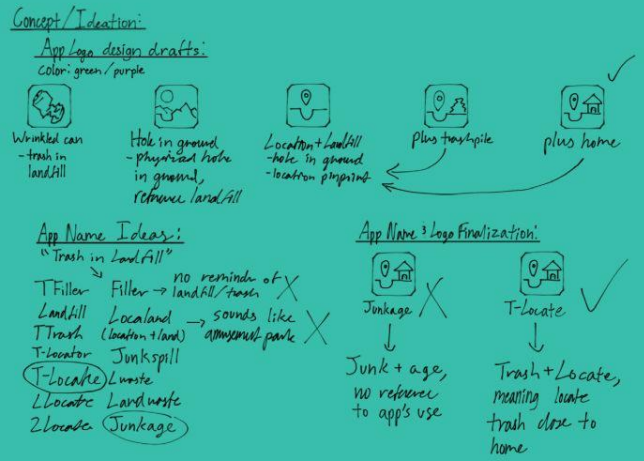
1 Government/ city management doesn't take responsibility
2 Little general information about landfills presented in schools
3 Little information on treatment for landfill-caused effects
4 Takes time to develop alternative solutions for landfills (not total removal, but control of illegal dumpings and improperly dumped landfills)

Design Thinking/ Concept and Ideation

Design Thinking

Toxic landfills and house proximity to these toxic landfills are a serious problem and should not be overlooked. The general public should be more educated about this global problem as we pass on the world to future generations: especially because the negative effects not only cause harm to the environment, but our bodies and our children's' bodies as well. T-Locate will solve some of these problems caused by living in close proximity to toxic landfills by alerting the public and by providing medical resources to protect their health and families.

Make app that shows where landfills are
Have a social media type aspect to the app, where people can share photos of landfills/ trash piles close to home to alert city trash management
Have doctors available on the app to give medical attention/ treatment to users that have been affected by landfills & poor hygienic areas due to trash
Have important contacts (city trash management, emergency treatment, poison health control) on the app
Educative information on the app to the general public about landfills



Thought Process:

App name: T-Locate
From "T"rash and location

App logo:
Hole in ground for landfill

Location pinpoint as seen on many maps

Gives user sense of "where landfill is"

Home to show landfills close to home

Connects to purpose of app

Functions
Aims/ Objectives

Tell where landfills are
Provides information on what to do if affected by toxic trash exposure/ landfill

Information on leakage/ leachate sighting

Social media/ news type articles and reports available (to prevent and alert the public about dangerous areas affected by landfills)

Protect self and family members

Alert officials about problem with landfill

Improve way of life through protection of health

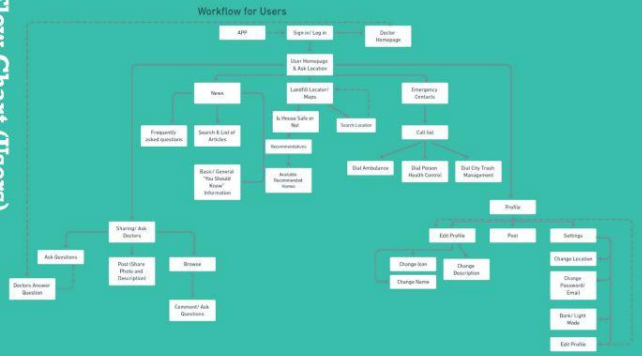
Educate the public about the dangers of improperly placed landfills

Make the government/ city management responsible for their lack of treatment of landfills (if any)

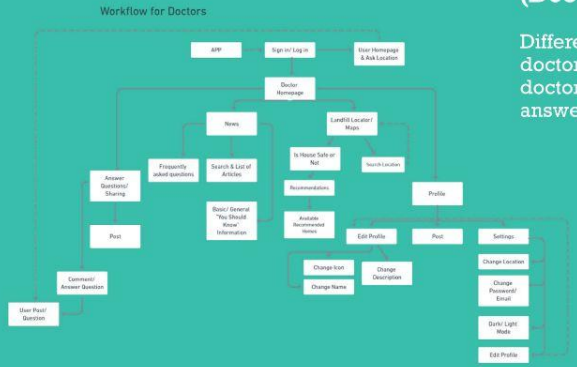
Get people who don't live near landfills to advocate for people who do live near landfills

Flow Chart & Wireframes:

Flow Chart (Users)

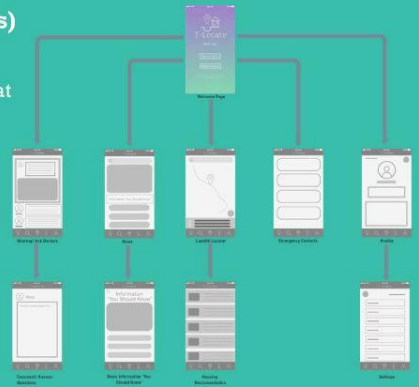


Flow Chart (Users)

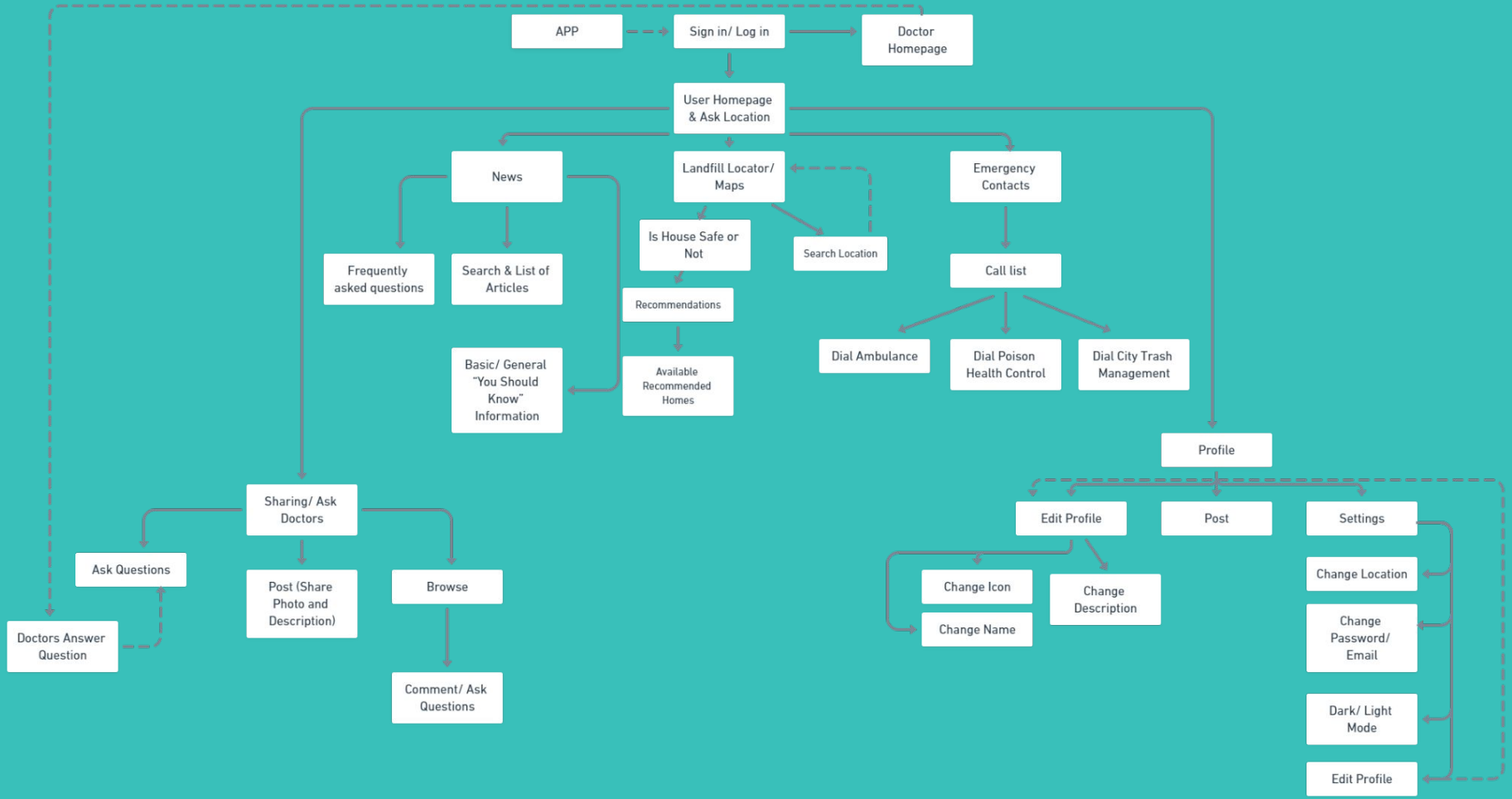


Wireframe (Doctors and Users)

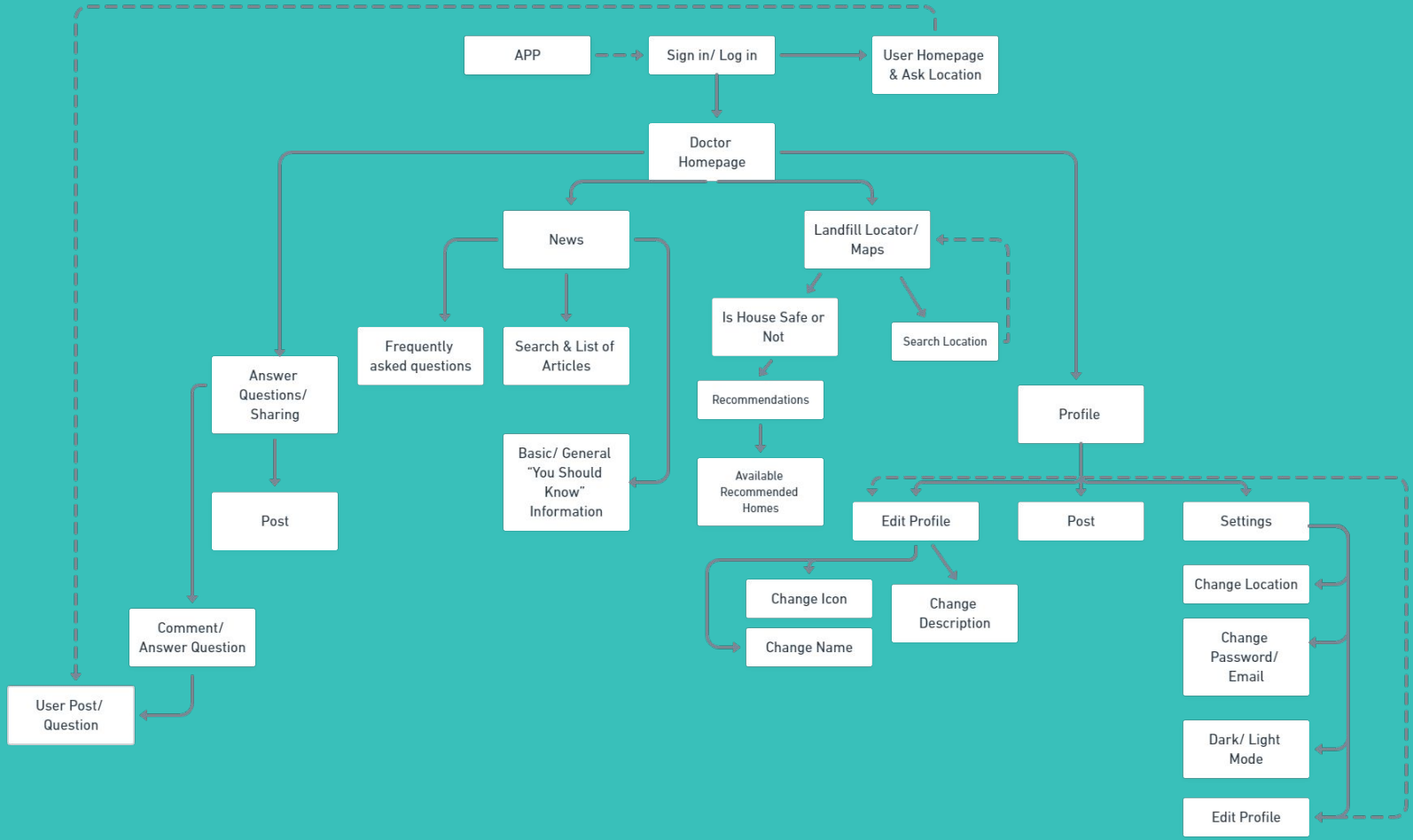
Difference between doctors and users is that doctors have verified answers



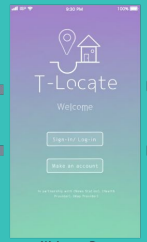
Workflow for Users



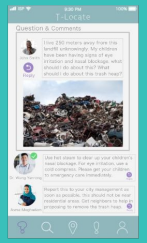
Workflow for Doctors



Wireframe

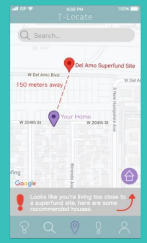


Welcome Page



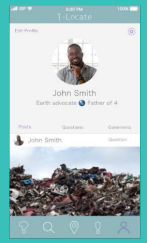
Sharing/ Ask Doctors

News

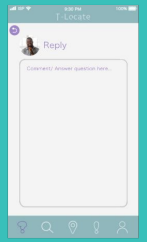


Landfill Locator

Emergency Contacts



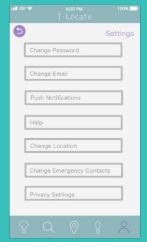
Profile



Comment/ Answer Questions

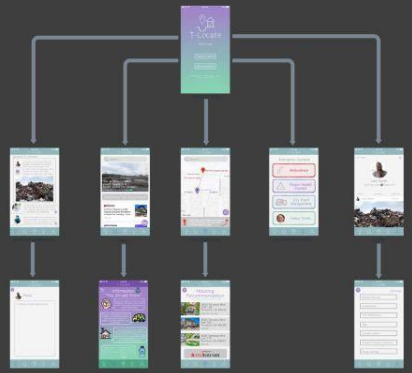
Basic Information "You Should Know"

Housing Reccomendation

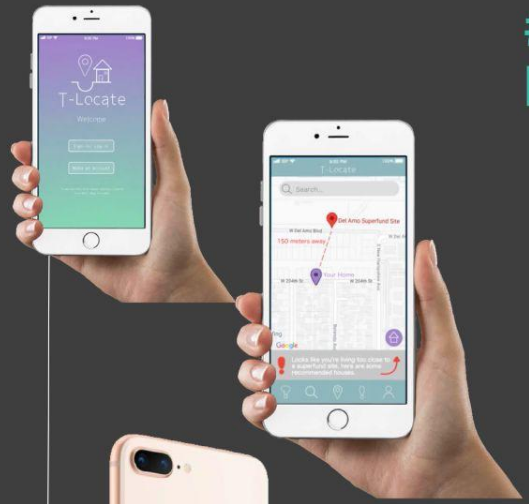


Settings

Final Interface



Storyboard, Mockup, UI Design, Collage



Mock UP

Logo, UI Elements, colors and hex code

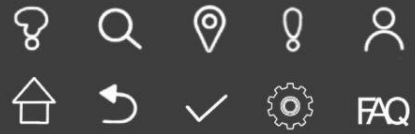
Logo

T-Locate

The logo includes a pin seen on maps, with a hole in the ground to represent a landfill, meaning the app locates landfills near homes.

Color Palette

UI Elements



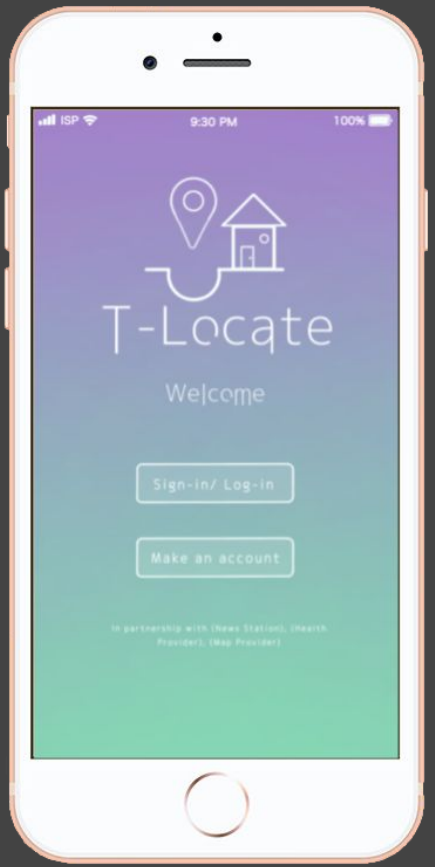
Font

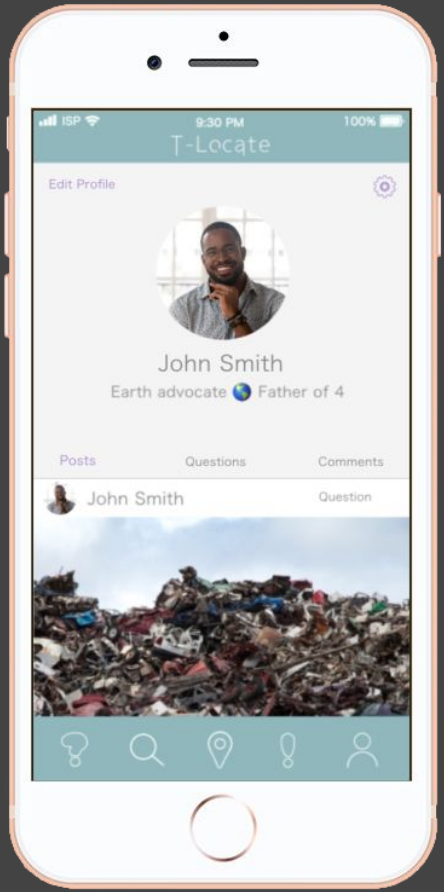
Jiyuno Tsubasa Font
Size 26, 59

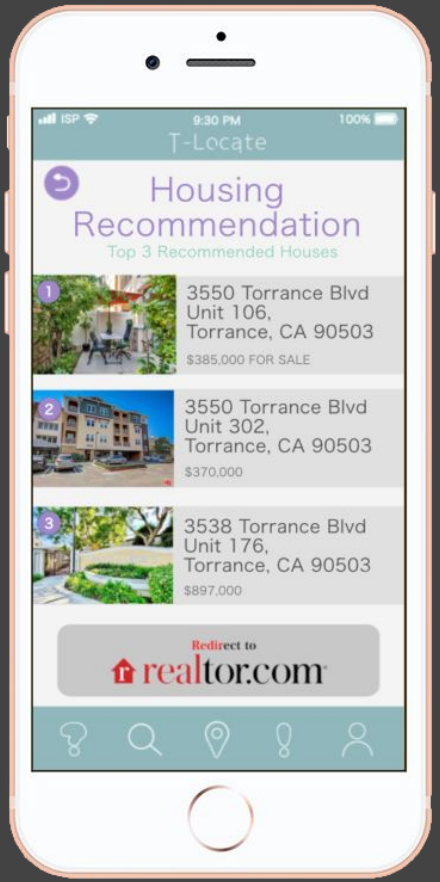
Hiragina Sans W3
Size 13, 15, 19, 25, 38

HiraMinProN-W6
Size 13, 22

Mock up (gold)


ISP
9:30 PM
100%
T-Locate
Welcome
Sign-in/ Log-in
Make an account


ISP
9:30 PM
100%
T-Locate
Edit Profile
John Smith
Earth advocate Father of 4
Posts
Questions
Comments
John Smith
Question


ISP
9:30 PM
100%
T-Locate
Housing Recommendation
Top 3 Recommended Houses
1
3550 Torrance Blvd Unit 106, Torrance, CA 90503
$385,000 FOR SALE
2
3550 Torrance Blvd Unit 302, Torrance, CA 90503
$370,000
3
3538 Torrance Blvd Unit 176, Torrance, CA 90503
$897,000
Redirect to
realtor.com

ISP 9:30 PM 100%

T-Locate

Information "You Should Know"

Food and greens are the most disposed of waste, think twice before throwing away leftover food in the trash.

Improperly disposed of waste in landfills can generate leachate (polluted liquid) which can pollute land, groundwater, and waterways.

Long exposure to toxic landfills (also can be called superfunds) can cause irritation in the eyes, lungs, and throat. It can also cause a high risk of encephalopathy to children due to high lead exposure.

Plastic takes 10-100 years just to decompose in a landfill. It's also the second most landfilled material after food. Be sure to properly recycle or reuse plastic

ISP 9:30 PM 100%

T-Locate

Emergency Contacts

Ambulance

Poison Health Control

City Trash Management

Hailey Smith

ISP 9:30 PM 100%

T-Locate

Search...

Information "You Should Know"

NOOZHAWK

County's Tajiguas Landfill Facing Estimated $20 Million in Alisal Fire Damage, Closu…

1 day ago

FAQ

yahoo/news