Software Requirements Specifications

for

Urban Earth iOS Application, Release 1.0

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1. Vision and Scope

1.1 Business requirements

We are living in a world where the prospect of catastrophe from climate change becomes more and more likely every day. Climate change isn't the only threat brought about by the industrialization of our world. So is the air pollution caused by ICE (internal combustion engine) cars and the like. Additionally, the availability of non-renewable resources is dwindling by the day. Therefore, now more than ever it is important for us to be cognizant of the changing world around us and create a more sustainable world for everyone. This is the message that billions of consumers throughout the world are echoing. People want a way to track how sustainable they are every day so they can consciously do better. Choosing transportation is one of the best and easiest ways for consumers to make an impact immediately. So, by tracking consumers' transportation habits and how sustainable they are, this app can incentivize people to be more sustainable and show them how sustainable their decisions are. Additionally, another concern users have is safety when it's late at night. The app can alert users of these situations. The following are the business objectives for this project:
BO-1: Have users increase the number of miles they sustainably commute by at least 10% from the first week they use the app to the second week they use the app.
BO-2: Have users decrease their transportation CO_2 emissions by at least 10% from the first week they use the app to the second week.

The following are the success criteria:
SC-1: Have 5 daily users within the first month of the app's release
SC-2: Have an average of at least a 4-star rating within the first month of the app's release.

The following are business risks:
RI-1: Since the app is tracking transportation information it may need to be running in the background, which could cause poor battery life and decrease user participation (Probability=0.2, Impact = 5)
RI-2: People may have privacy concerns about their location being tracked, which could cause them to use the app less (Probability=0.1, Impact = 2)

1.2 Major Features

FE-1: Record the mileage and time duration of users who travel on different forms of sustainable transportation (or walk) with start and stop buttons (manually) and automatically (using the user's location data)
FE-2: Calculate the sustainability score per trip (the sustainability score is either the equivalent amount of CO_2 prevented from emitting into the atmosphere per trip, the number of trees planted, or the number of polar bears saved per user choice) and display it
FE-3: Record the travel history of users under one's profile including the mileages, forms of transportation, time duration, and sustainability score
FE-4: Allow users to add, select, delete or delete in groups, and change the traveling history
FE-5: Allow users to see a graph of their sustainability score over time
FE-6: Alert users to stay attentive and aware of their surroundings when it's dark out
FE-7: Allow users to add and search a friend, view the sustainability score of friends, and build a community within Urban Earth (Figure 2)

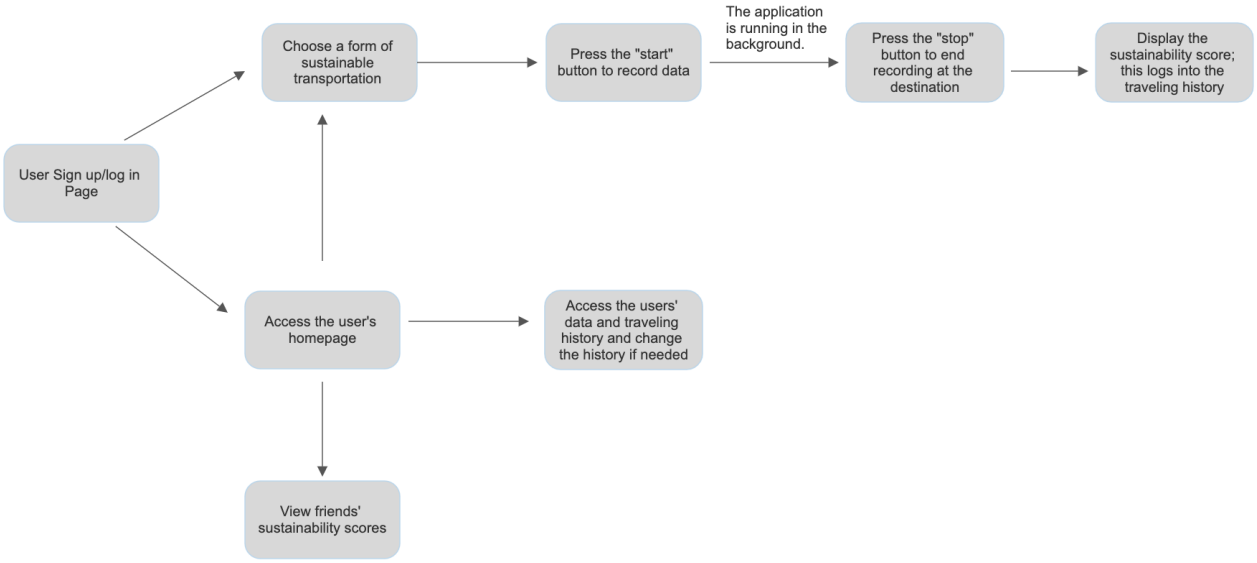

Figure 1: The Overall Rundown of Major Features

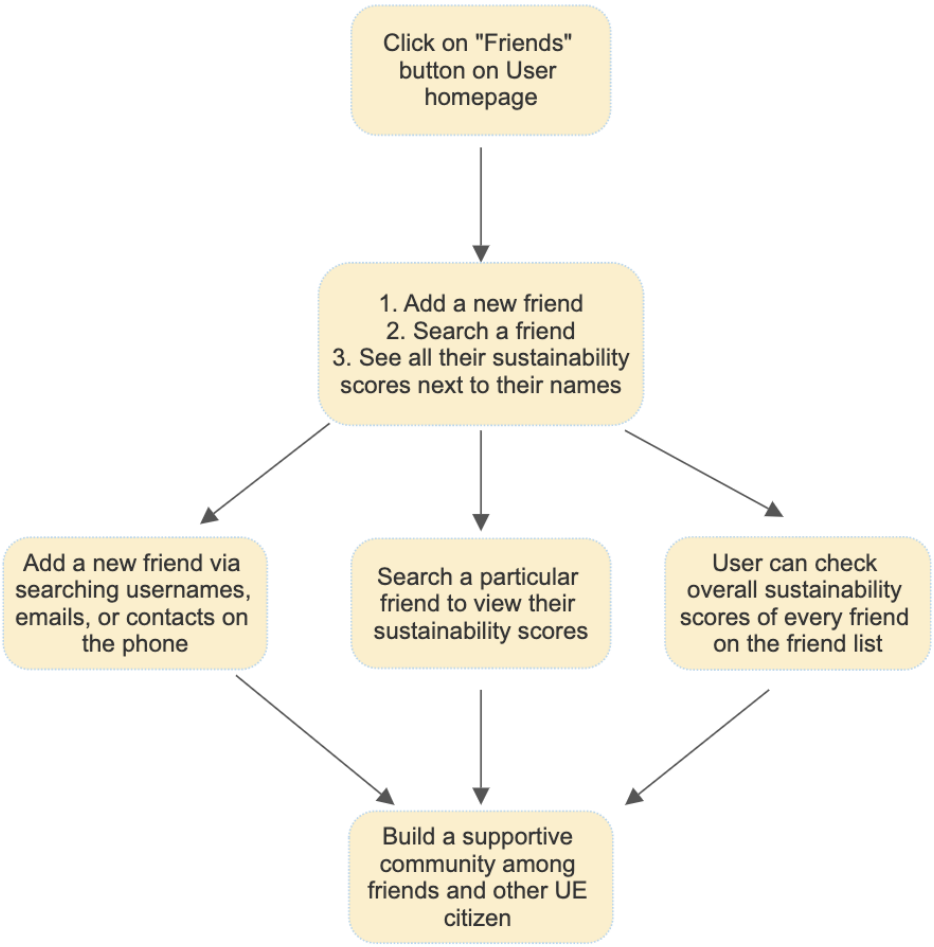

Figure 2: Urban Earth Citizen Community Features

1.3 Limitations

LI-1: There are some levels of difficulty in terms of calculating the sustainability scores. Taking public transportation such as busses can be considered sustainable but busses are fueled by gasoline which emits CO_2 into the atmosphere but not necessarily as much as driving a car powered by gasoline (depends on how many people are on the bus)

LI-2: The application can detect the movement of transportation but it is necessary to enter manually the form of transportation vehicles. For instance, the application can detect users on a vehicle but not necessarily about the model of the vehicle thus may require users to enter information manually.

1.4 Business Context

Stakeholder Profiles

Stakeholder	Major Value	Attitudes	Major Interests	Constraints
App Users	A simple way	strong	simple design,	can’t be much

	to track how sustainable their transportation is while being safe	enthusiasm, but potential concern about battery life and privacy. Want to see how this differs from other sustainability apps	clear to see the impact being made	manual effort involved
Sustainable Transportation Providers	app usage encourages users to use their products	excited for public discussion moving in their direction, concern about estimating CO2 emissions being inaccurate	potentials for advertisements or other direct promos	can't necessarily give over all the information about their products to estimate CO2 emissions as it may be proprietary
Local Community	cleaner community that could also have sustainable economic opportunities	interested, but skeptical how big of an impact it will have outside of the app users and transportation providers	potentials for sustainability grants for the city	none identified

2. Software Requirements Specifications

2.1 Overall Description

2.1.1 Product Perspective

Urban Earth is an iOS application that automatically tracks the mileage of users traveling on a sustainable form of transportation per day. Additionally, it alerts users to be safe when it is dark outside. Furthermore, it encourages user participation by allowing users to add their friends to the app and see their friends' "sustainability scores" which can be fun and motivating. This app is expected to evolve to not only track sustainability in transportation, but eventually sustainability in nutrition, among

other topics. Additionally, it is expected to integrate with other apps such as Bird, Lime, Spin, etc. that offer sustainable electric scooters as an alternative to gas cars, as well as Uber, Lyft, etc which offer “green” options for their ridesharing services.

2.1.2 User Classes and Characteristics

- Sustainability-Conscious User
    - A sustainability-conscious user is someone who wants to personally make an impact on the environment by living a planet-friendly, green lifestyle. These users will want to not have to put much manual tedious effort into their daily use of the app (such as manually entering which car they’re in every time, or manually saying how far their trip to work is, etc). They’ll want to see clearly how much of an impact they’re making, how they can do better, and if they’ve been improving.
- Safety-Conscious User
    - A safety-conscious user is someone who wants to stay safe, especially when they’re traveling. These users won’t want to have to put much manual effort into the app such as manually inputting their time zone. They will want to be alerted immediately if they need to be alert.

2.1.3 Operating Constraints

OC-1: Urban Earth shall work on all currently supported iOS versions.
OC-2: Urban Earth shall work whether the user is on WiFi or cellular data.

2.1.4 User Documentation

UD-1: The design of the user interface shall be simple and intuitive so that it’s clear how the app should be used.
UD-2: There will be a help button that the user can click to either go through a tutorial that will walk through all the features of the app, or allow them to ask questions about a specific feature.

2.1.5 Assumptions and Dependencies

AS-1: To accurately track sustainability and health information and give safety alerts, the user must have their phone on all the time.
AS-2: For all of the features to work, the user’s phone must be connected to the internet in some way.

2.2 System Features

2.2.1: Record Trip

2.2.1.1 Description and Priority

- Record the mileage and time duration of users who travel on different forms of sustainable transportation (or walk) with start and stop buttons (manually) and automatically (using the user's location data). Priority = High

2.2.1.2 Stimulus/Response Sequences

- Stimulus: User clicks the start button
  Response: The app starts actively tracking the user's location, and starts a timer indicating how long the user has been traveling
- Stimulus: User clicks the stop button
  Response: The app stops actively tracking the user's location, and stops the timer.
- Stimulus: User turns on automatic tracking
  Response: The app asks the user if it's okay for location data to be on all the time. If the user says yes, then the app begins tracking the user's location data to determine when they've taken a trip and on what form of transportation it was.
- Stimulus: User turns off automatic tracking
  Response: The app stops trying to determine when a user is traveling

2.2.1.3 Functional Requirements

- Trip.Start: The system begins tracking the user's trip
- Trip.Stop: The system stops tracking the user's trip
- AutomaticTracking.On: The system starts automatically determining when the user is taking trips
- AutomaticTracking.Off: The system stops automatically determining when the user is taking trips

2.2.2: Calculate Sustainability Score and Display

2.2.2.1 Description and Priority

- Calculate the sustainability score per trip (the sustainability score is either the equivalent amount of CO_2 prevented from emitting into the atmosphere per trip, the number of trees planted, or the number of polar bears saved per user choice) and display it. Priority=High

2.2.2.2 Stimulus/Response Sequences

- Stimulus: User presses stop
- Response: a formula calculates the sustainability score based on the distance traveled, the form of transportation, and the time duration

2.2.2.3 Functional Requirements

- Trip.Stop: The system calculates the sustainability score and displays it

2.2.3: Record History

2.2.3.1 Description and Priority

- Record the travel history of users under one's profile including the mileages, forms of transportation, time duration, and sustainability score. Priority = Medium High

2.2.3.2 Stimulus/Response Sequences

- Stimulus: User presses stop
- Response: The user's trip is logged in their history

2.2.3.3 Functional Requirements

- Trip.Stop: The system records the user's trip in their history

2.2.4 Edit History

2.2.4.1 Description and Priority

- Allow users to add, select, delete or delete in groups, and change the traveling history in the case that what was manually or automatically recorded was incorrect. Priority = Medium

2.2.4.2 Stimulus/Response Sequences

- Stimulus: User presses the add button
- Response: Form pops up for the user to fill out time duration, distance traveled, and form of transportation used and sustainability score is calculated
- Stimulus: User presses the select button
- Response: This pops up the details on the specific trip allowing the user to edit the time duration, distance traveled, and form of transportation used if desired
- Stimulus: User presses the delete button
- Response: This pops up a prompt saying "are you sure you want to delete" if the user presses yes this is deleted from the user's data
- Stimulus: User selects multiple trips and then presses the delete button
- Response: Same as for single delete, except the result is deleting the multiple trips that were selected

2.2.4.3 Functional Requirements

- Trips.Add(time duration, distance traveled, mode of transportation): adds the corresponding trip to the user's data
- Trips.Edit(time duration, distance traveled, mode of transportation): edits the corresponding trip to the user's data
- Trips.Delete(trips…): deletes all of the trips that were selected

2.2.5 Graph sustainability scores over time

2.2.5.1 Description and Priority

- Allow users to have a general sense of their sustainability scores trending over time such as the past week the past month, and the past year. This is a low priority but users may feel rewarded to see a summary of their efforts. Priority = Low

2.2.5.2 Stimulus/Response Sequences

- Stimulus: Users press the summary button
- Response: the app graphs the trendline based on data collected from the past

2.2.5.3 Functional Requirements

- Summary.ShowGraph: displays graph to the user
- Summary.Weekly: shifts x-axis to show a week's worth of dates
- Summary.Monthly: shifts x-axis to show a month's worth of dates
- Summary.Yearly: shifts x-axis to show a year's worth of dates

2.2.7 Safety Alerts

2.2.7.1 Description and Priority

- Alert users to stay attentive and aware of their surroundings when it's dark out. Priority = High

2.2.7.2 Stimulus/Response Sequences

- Stimulus: User presses start and it's between sunset and sunrise in the location the user is in
- Response: the app alerts the user that it's late out and tells them to be safe!
- Stimulus: The user starts to go on a trip and has automatic trip tracking on
- Response: the app alerts the user that it's later out and tells them to be safe!

2.2.7.3 Functional Requirements

- Safety.Alert: send safety alerts to the user

2.2.8 Add and View Friends

2.2.8.1 Description and Priority

- Allow users to add and search a friend, view the sustainability score of friends, and build a community within Urban Earth. Priority = Medium High

2.2.8.2 Stimulus/Response Sequences

- Stimulus: user clicks add friend next to the person's profile
- Response: this sends a notification to the person the user is trying to befriend
- Stimulus: user accepts a friend request
- Response: the two users are recorded as friends in the system
- Stimulus: search for a friend in the search bar
- Response: the friends with the closest name to what was searched show at the top next to the search bar

2.2.8.3 Functional Requirements

- Friends.Add(friend): adds a friend to the user's friend circle
- Friends.Search(friend): searches for a friend in friend list

- Friends.Accept(friend): accepts a friend request

2.3 Other Nonfunctional Requirements

2.3.1 Performance Requirements

PE-1: The application shall allow 100 users simultaneously to track their mileages during rush hours and record the mileages throughout the trips.
PE-2: It should take less than 20 seconds to calculate the sustainability score for a trip 90% of the time.
PE-3: It should display a notification to users that it has started recording no longer than 10 seconds after the detection of users' movements on a vehicle (if the user has automatic recording enabled)

2.3.2 Reliability Requirements (work on this more later)

RR-1: The system should be available 99% of the time during the time windows of 6 - 10 AM and 3 - 7 PM.
RR-2: The system should display the history of travels for users after the users log in 90% of the time.
RR-3: The system should be able to record the mileages and time duration while running in the background.
RR-4: The distance calculated by the application should be 80% accurate compared to the actual distance traveled by the user.

2.3.3 Usability Requirements

UR-1: The application shall be easy and intuitive to use.
UR-2: The application shall allow the user to navigate their profiles easily.
UR-3: The application shall be convenient to use for travelers who have only one free hand.
UR-4: The application shall be straightforward for users to select forms of sustainable transportations and track their mileage.
UR-5: The application shall be easy for users to add, select, delete or delete in groups, and change the traveling history.

2.3.4 Security Requirements

SR-1: The application shall ask for permission to access the location data.
SR-2: The application shall keep all users' usernames, passwords, emails, and data confidential.

2.4 Inspection log

Name	Comments
Niki Wang	After reviewing the software requirements specifications, 2.1.1 product perspective included that Urban Earth can be further evolved to track the sustainability in nutritions which can be difficult to record and slightly off-track about the goal of this application which is to incentivize people to travel sustainably and healthily.
Jeffrey Kozik	1.1 Business Requirements is a little too long and could be more concise 2.3.2 Reliability Requirements RR-2 isn't ambitious enough in terms of the reliability of the history logs 2.2 System features could be 1) less redundant and 2) more precise with exactly what each feature does