



# RecycleRight

Team RecycleRight - Business Plan  
Victoria [REDACTED]

## Executive Summary

### I. Problem

Rising levels of greenhouse gases in the Earth's atmosphere are affecting our climate and causing irreversible damage to the planet as we know it. Many of these changes can be traced back to solid waste. Participating in community recycling programs is the one of the most effective actions individuals can take to simultaneously improve: the environment, the economy, sustainable manufacturing and to prevent waste from going into oceans. Despite widespread adoption of community recycling programs, there is a lot of room for improvement. Of the more than 2 billion tons of municipal solid waste that is produced worldwide each year, only an estimated 13.5% of a possible 75% is recycled.<sup>1</sup> Awareness of the problem of climate change is high and individuals are passionate about doing their part to protect our planet. Recycling allows individuals to have a direct impact on bettering the environment. Although, recycling done improperly can cause more harm than good. The first step that the vast majority of people take is starting to recycle, but despite their best efforts, research conducted by OnePoll suggests that about 62% of people are confused on the proper way to recycle.<sup>2</sup> This confusion can lead to recycling contamination and actually cause more harm than good. Recycling contamination is created when the wrong materials are put into the system (e.g., hoses, propane tanks, etc.) or when the right materials are prepared the wrong way (e.g., recyclables in plastic bags, food left in containers, etc.).<sup>3</sup> In fact, one piece of contaminant found in a recycling stream, can cause a whole stream of actual recyclable materials to be sent to the landfills. This recycling contamination problem has reached a point where the amount of recycled material that is too contaminated to use has increased by 257% over the past decade.<sup>4</sup> As a result of this pervasive issue, China, who was previously the centre of the global recycling trade market, decided to stop importing "dirty" recyclable materials, causing a global recycling crisis as waste companies are scrambling for alternative solutions. It is difficult to be knowledgeable on what is and isn't recyclable, especially when these regulations can vary drastically, depending on location. This fact can seem daunting and discouraging to many, yet local communities have already invested in recycling programs and infrastructure, and all that is left is to use these resources to their full advantage. If this trend continues the way it has over the last decade, communities around the world will continue to scale back their recycling efforts, closing their programs and curtailing progress made on a global level. This excess waste will form new environmental problems as nations resort to burning recyclables or tossing them in landfills where they will stay, polluting the environment for centuries to come.

### II. Solution

To address the issue of recycling contamination, the application, RecycleRight, provides a solution oriented around ease of use and the convenient access to accurate information. By facilitating and simplifying the recycling process for users who would like to help the environment by recycling, but either find the process to be too difficult, or do not know the proper regulations for recycling in their area, the app is designed to help individuals make accurate decisions at the time they are recycling or discarding an item. To provide the easiest experience and encourage use, we use innovative and engaging technologies as well as location-based information which allows users to identify the correct items and streamline the recycling process. The optimal solution to recycling contamination

<sup>1</sup> Ellis, C (2018, September 23) World Bank: Global waste generation could increase 70% by 2050 Retrieved from <https://www.wastedive.com/news/world-bank-global-waste-generation-2050/533031/>

<sup>2</sup> Swins (2019, April 16) More than half of Americans are confused about recycling Retrieved from <https://nypost.com/2019/04/16/more-than-half-of-americans-are-confused-about-recycling/>

<sup>3</sup> Marshall, C , & Bandhauer, K (2017, April 19) The heavy toll of contamination Retrieved from <https://www.recyclingtoday.com/article/the-heavy-toll-of-contamination/>

<sup>4</sup> maggielb1 (2019, January 10) The Era Of Easy Recycling May Be Coming To An End Retrieved from <https://fivethirtyeight.com/features/the-era-of-easy-recycling-may-be-coming-to-an-end/>

is a wide database of information where a user can go to quickly find what they are looking for without having to navigate through complicated websites and links.

## Company Description

### I. Mission

RecycleRight's mission is to promote proper recycling habits in an attempt to propel the environmental preservation movement by addressing the issue of waste contamination.

### II. Structure

As a social enterprise, RecycleRight reinvests its profits into the company's operations. RecycleRight operates as a sole proprietorship business entity owned in full by Victoria [REDACTED] the founder of RecycleRight.

### III. Management

All operations of RecycleRight are directed by the owner Victoria [REDACTED] who also acts as the primary software developer. Victoria [REDACTED], a Miami native, has extensive experience in programming and engineering through her school sponsored programs and classes.

### IV. Service

RecycleRight is a mobile application that facilitates and simplifies the recycling process for users who would like to recycle, but either find the process to be too difficult, or do not know the proper regulations for recycling in their area. It tackles the issues of waste contamination in an innovative way in addition to seeking to provide specific information that is relevant to the user's current location. The app allows people to quickly identify whether an object is recyclable or not through object recognition technology as well as detailing bin specific recycling information via Augmented Reality technology using a specialized sticker that Team RecycleRight has created to place on recycling bins around the community.

### V. History

RecycleRight started as a school project to try to encourage students to be more mindful of how they were affecting the environment around them after its founder, Victoria [REDACTED] noticed several colleagues exercising irresponsible recycling habits. Its intent was always to apply computer science, and new technologies, to address Victoria's passion for environmental preservation by informing people about recycling restrictions in their area, but gradually shifted to becoming a universal system that people could use to find out what materials belong in each bin to tackle the problem of recycling contamination. RecycleRight was first built using block coding, but as more technology became available, RecycleRight started implementing technologies such as image recognition, machine learning, and augmented reality.

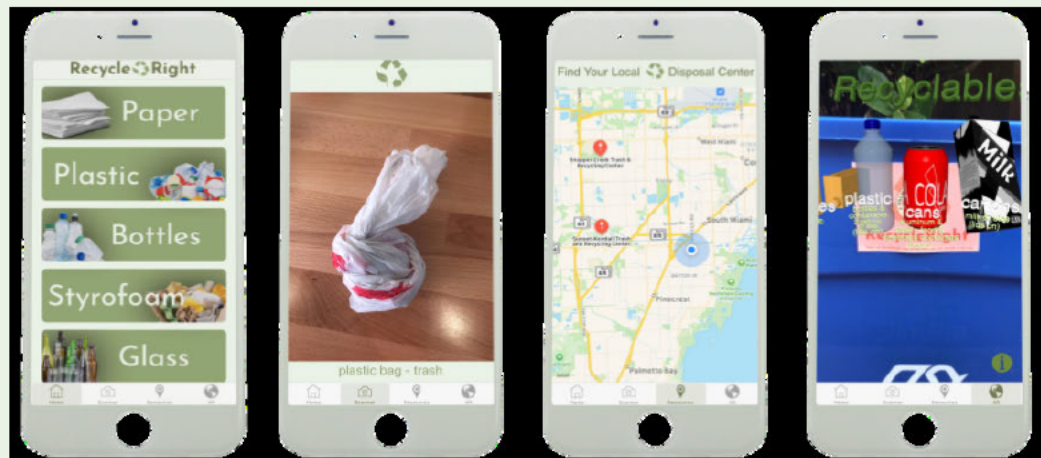
### VI. Objectives

In the very near future, Team RecycleRight plans on getting an official launch of RecycleRight on the app store but before then, the software development team must refactor code, and enhance the AR and object recognition technology to optimize how the app runs on all devices. The management team at RecycleRight will also begin local endeavours to reach out to nearby counties in the South Florida area to have their government officials endorse the movement and begin placing the stickers on public recycling bins. Eventually, the long term goals include implementing RecycleRight stickers systematically throughout the state and continuing expansion, as well as forming partnerships with other environmental preservation organizations in promoting the RecycleRight mission and other forms of community outreach, expanding its digital footprint, and adding new features to the application with include options for user feedback, more augmented reality location models to reach a wider audience, and additional information on composting.

## The Service

### I. Features

RecycleRight is a free iOS application tailored for easy and quick access to recycling information via an intuitive interface for scanning recycling bins and items. Features of the app include a home page with general categories of waste and detailed information regarding what can or can't be recycled. Additionally in light of the recent COVID-19 epidemic, there is an option to view how to properly dispose of contaminated personal protective equipment. For items that may need to be recycled or thrown away in specific disposal centers, such as e-waste, there is also a map that gives the name and address of the closest recycling centers in the area. The app allows people to scan a



specialized sticker that we have created to place on recycling bins around the community, which will detail bin location specific information via Augmented Reality technology. This AR animation displays to users what distinct recyclables the scanned bin accepts in an innovative and engaging way. Additionally, the app includes a scanner, which implements a specifically trained machine learning model to detect the object in question in real time, and proceeds to recognize and inform the user regarding whether or not it is recyclable. RecycleRight was created using Swift in the XCode IDE, with tools such as the CoreML vision recognition framework, ARKit for augmented reality, Apple Maps, and Github.

## Market Analysis

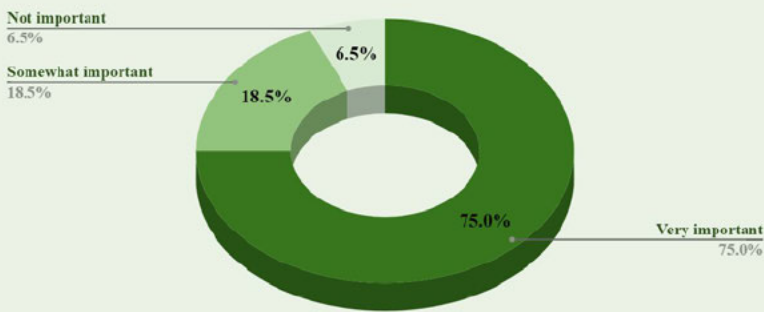
### I. The Market

RecycleRight is marketed to everyone with basic smartphone technology (i.e. front facing camera), willing to help the planet by recycling. Team RecycleRight's current efforts are focused on reaching out to local governments to implement this technology throughout the community, as well as the education of environmentally friendly behavior to students in our local academic institutions.

### II. Consumer Research

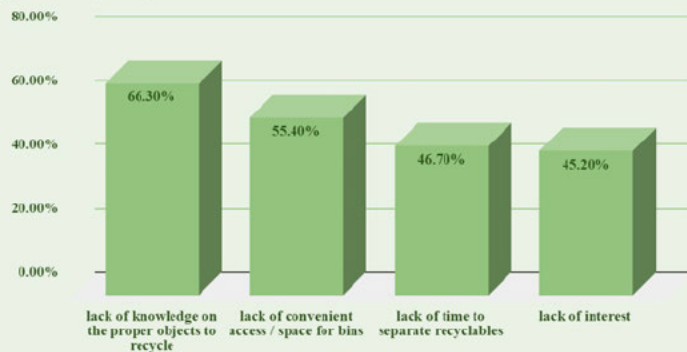
To gain a greater understanding of the recycling habits of people in our community Team RecycleRight conducted a survey with more than 100 respondents to assess our target audience. Subjects were asked questions about what items and how often they recycle as well as what they believe are the largest barriers that prevent people from recycling. Over 75% of those questioned believed that of all the things they do protect the environment, recycling is very important. Within that same group, more than half provided responses that indicated they

*Of all the things you do to protect the environment, how important do you believe recycling is?*



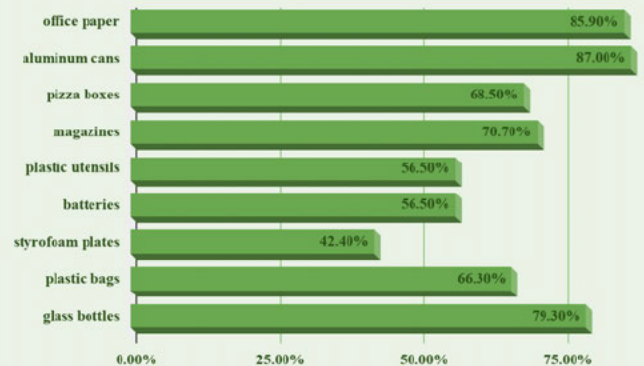
were recycling incorrectly. They would recycle objects such as dirty pizza boxes, and plastic bags and utensils, which contaminate the recycling bin and cause the entire bin to go to a landfill. When questioned what they

*What do you believe are the largest barriers that prevent people from recycling?*



more than 100 respondents to assess our target audience. Subjects were asked questions about what items and how often they recycle as well as what they believe are the largest barriers that prevent people from recycling. Over 75% of those questioned believed that of all the things they do protect the environment, recycling is very important. Within that same group, more than half provided responses that indicated they

*What do you recycle?*



personally believe are the largest barriers that prevent people from recycling, more than 65% of those surveyed responded that it was the lack of knowledge on the proper objects to recycle. This brief survey demonstrates that people understand the importance of recycling and have good intentions yet additional education and resources are needed to maximize the potential of recycling programs.

### III. Competitor Analysis & Competitive Edge

RecycleRight is an innovative application that offers a solution to the problem of recycling contamination in one convenient location. It addresses the issue by using new technologies such as object recognition and augmented reality that make the app engaging and easy to use. This app offers an all in one solution to promote correct recycling, and while other large competitors such as iRecycle and RecycleSmart may provide general guidelines for recycling and nearby recycling centers, they lack the ability to adapt to the differing regulations of specific bins and counties, as well as the engaging, innovative features that improve convenience such as real time object recognition and AR bin animation. When recycling regulations differ so greatly based on a user's location, it is important to focus on streamlining the information in the most detailed, location-based manner possible, which is what the app intends to do.

Features of the app that allow it to gain a competitive edge include, location (bin) specific information via AR technology, its convenience - (3D object recognition), location specific resources (disposal centers), recycling guidelines, a simple UI - easy to use, the fact that no internet access required to use, and it is a completely free application. Additionally, in light of the recent COVID-19 epidemic, there is an option to view how to properly dispose of contaminated personal protective equipment which has been undressed by other competitors.

<i>Competitor Analysis</i>	iRecycle	Wastify	RecycleSmart	Gimme 5	RecycleNation	RecycleRight
Recycling Guidelines for all Materials						
Real Time Object Recognition						
Bin Specific Recycling Info						
Nearby Recycling Centers						
PPE Guidelines						

## Strategy & Implementation

### I. Marketing Strategy

To begin promoting the RecycleRight application and movement, the management team at RecycleRight will start local endeavours to reach out to nearby counties in the South Florida area to have their government officials endorse the movement and begin placing the stickers on public recycling bins. We will seek to be endorsed by these local governments by marketing ourselves as an easy way to maximize their profits using their current recycling infrastructure in place by offering a solution to improve the quality of the waste they collect, streamlining their process. Eventually, the long term goal is to implement RecycleRight stickers systematically throughout the state and continue expanding, using community recycling programs and organizations as a gateway to reach the target audience. The stickers produced, to be used alongside the app, are intended to be placed on as many recycling bins as possible. This is the optimal vehicle to increase community awareness of the app by promoting and endorsing downloading the app through the branding on the stickers.

The software development team will continue to update the app's UI to stay up-to-date and fully functional. Along with this, the development team is already in the works of creating a RecycleRight website to keep users up to date on all the newest functionalities and increase the company's digital footprint. This website, and other forms of increased social media promotion will help build a strong online presence for the organization. Team RecycleRight will seek to be endorsed/partner with other environmental preservation organizations in promoting the RecycleRight mission and other forms of community outreach. In partnering with these organizations, it allows us to inform those truly invested in the environmental preservation movement who participate in local summits and cleanups about the application which in turn can improve user acquisition and promotion by word of mouth.

Upon releasing the app we plan to conduct a study by comparing the contents recycled by those using the app, and a control group not using the app over a period of weeks. This will allow us to gain conclusive data on to what extent the use of the app improves the recycling habits of users and evaluate the effectiveness of the app's current technologies, making future updates and changes to address the concerns. Having personally conducted customer research through a survey we have addressed general concerns within the app regarding the barriers to recycling presented, yet we plan to adapt to the market feedback upon initial release, by implementing a new feature to allow users to rate their experience using the app, and offer constructive criticism through the app and website.

### II. Distribution

In the very near future, Team RecycleRight plans on getting an official launch of the free iOS version of the RecycleRight application on the app store as we begin the endeavour to reach out to local offices and begin the initial distribution of the branded recycling bin stickers. By promoting RecycleRight as a free app, that will incentivize the downloading and use of the application. After collecting and implementing user feedback, the developers will begin creating the Android version of the app to release and reach a greater audience.

### III. Branding

The RecycleRight's branding reflects its mission to increase environmental preservation. The logo's color palette uses deep greens inspired by the phrase, "Going Green", and symbolizing growth, renewal, and nature. The name RecycleRight, is clear, concise, and descriptive, as it is also able to detail the objective and purpose of the app. The app's corresponding stickers also reflect the similar branding strategy.



**RecycleRight**

## Financial Plans and Projects

### I. Funding

Initial expenses for the community use of the app includes the manufacturing of the first few RecycleRight stickers to be distributed and be placed on public bins. It is important for the RecycleRight brand name to be protected by law so the company will be filing a trademark application with the USPTO for the name RecycleRight and its corresponding logo, as well as purchasing a corresponding domain name. This will only occur after the business has filed an S corporation election with IRS to officially transition from a sole proprietorship business to its own individual entity. All property will be legally transferred from Victoria ██████████ to the corporation which she will have full 100% ownership of. As a result, the estimated initial financial investment is \$650.

### II. Monetization

To allow for the additional funds necessary to expand the organization and social impact of the cause, once having acquired enough users to meet initial requirements, we will begin in-app advertising which effectively generates revenue by displaying advertisements within the mobile app. We will place non intrusive banner ads throughout the application using Google AdMob. In addition, once having reached out and been endorsed by county governments we expect them to invest the necessary funds to distribute the relevant RecycleRight stickers to their local public recycling bins. By sponsoring this movement, it allows them to generate greater profits with their current recycling infrastructure.

### III. Projections

We conservatively project a user acquisition of about 15% of county residents based on the survey we conducted within our community. This survey demonstrated that about 75% of respondents believed that recycling was important, and how 66.3% indicated the largest barrier that prevented them from recycling was the lack of knowledge on the proper objects to recycle, which our app addresses. This percentage translates to a final total of about 407,550 downloads within our initial target audience of Miami-Dade county. However, after calculating for user retention the final Monthly Active Users should total about 280,000 people. Accounting for the standard DAU/MAU ratio of 10-20%, we estimate about 42,000 daily active users for RecycleRight which will play into the Google Admob financial projections. Based on the typical 5 impressions/day average for multi-functional apps, we can expect about \$240 per day in ad revenue alone by the end of our 5 year projection. Startup expenses include the initial purchase of 500 stickers - \$209.20 / \$0.42 per sticker, \$10 to purchase our domain name, initial application fee for electronic filing USPTO - \$225 per class of goods/services, and the S corporation basic package (Florida) - \$169.

	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
MAU	14,000	58,000	176,000	247,000	280,000
<b>Revenue</b>	<b>\$5,110</b>	<b>\$21,170</b>	<b>\$64,720</b>	<b>\$90,155</b>	<b>\$102,200</b>
Sticker Manufacturing	\$500	\$1000	\$1000	\$1000	\$1000
Implementation Labor	\$150	\$300	\$300	\$300	\$300
R&D	\$45	\$500	\$2000	\$4000	\$5000
Marketing*	\$357	\$1,380	\$4,299	\$5,939	\$6,713
<b>Operating Cost</b>	<b>\$1,052</b>	<b>\$2,830</b>	<b>\$7,599</b>	<b>\$11,239</b>	<b>\$13,013</b>
<b>Gross Profit**</b>	<b>4,085</b>	<b>18,340</b>	<b>57,121</b>	<b>78,916</b>	<b>89,187</b>
<b>Gross Profit Margin</b>	<b>79.8%</b>	<b>86.6%</b>	<b>88.2%</b>	<b>87.5%</b>	<b>87.2%</b>
One Time Expenses***	\$650	N/A	N/A	N/A	N/A
<b>Cumulative Gains</b>	<b>4,085</b>	<b>22,425</b>	<b>79,546</b>	<b>158,462</b>	<b>247,649</b>

\*Calculated using typical 7-8 percent allocation recommendation

\*\*Gross profit margin may seem inordinately high, but is almost entirely due to the extremely low operating costs of the company

\*\*\*One time expenses include the initial startup expenses