NATIONAL ZERO WASTE CONFERENCE

1:00 pm Pacific Time
October 3, 2024

Track B

Concurrent PM

The Power of Tech in Litter Abatement

Speakers:

Emin Israfil
Annette Poliwka
JoAnn Gemenden

Moderator: Steve Jewett

Hosted by:

Day 2 • Zero Waste Communities

ZERO WASTE USA

1:00 pm Pacific Time
October 3, 2024

Track B

Steve Jewett

Founder

Clean Trails / National CleanUp Day

(Moderator)

The Power of Tech in Litter Abatement

National Zero Waste Conference 2024

Day 2 • Zero Waste Businesses & Institutions

Hosted by: Zero Waste USA

1:00 pm Pacific Time
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Track B

Emin Israfil

CEO

Rubbish

The Power of Tech in Litter Abatement

National Zero Waste Conference 2024

Day 2 • Zero Waste Businesses & Institutions

Hosted by: Zero Waste USA

Rubbish AI for Waste Management

How AI can help us clean up our neighborhoods and get better at recycling

National Zero Waste Conference - October 2nd, 2024 | emin@rubbish.love (10min + 2 min QA)

Featured by

Agenda

Intro: Emin & Rubbish Journey

Part 1: AI For Environmental & Illegal Dumping Data

Part 2: Where to dispose litter - Recycling AI

Part 3: Code Enforment AI

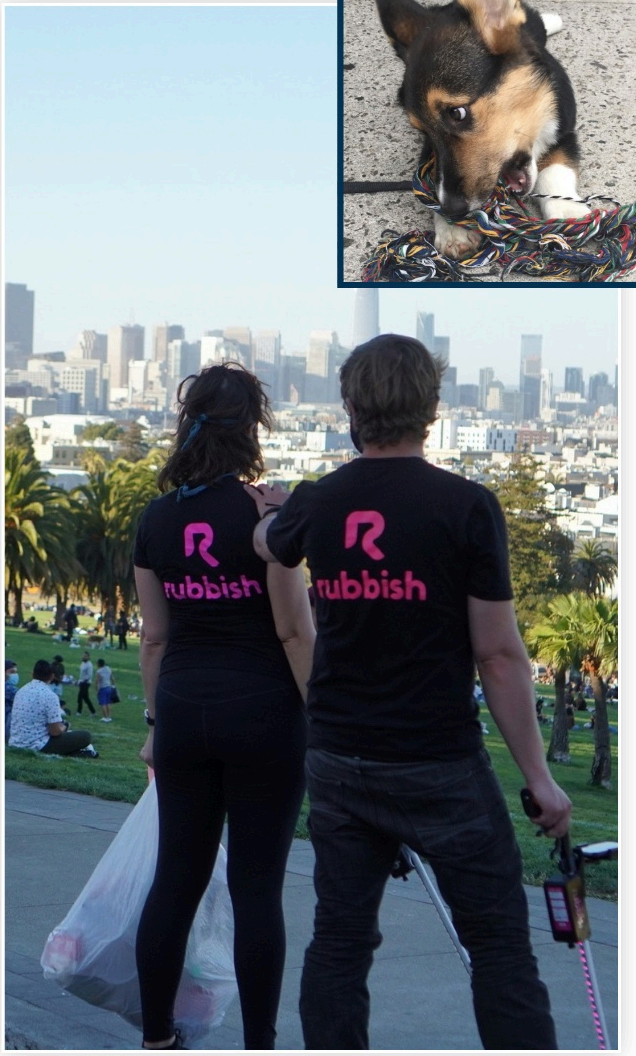
Demo

Rubbish Intro

Our goal is to create clean, healthy, and sustainable communities.

Emin Israfil, cofounder of **Rubbish,** and self-taught Garbageman.

Cleaning the Bay Area Since 2017



Journey

Apple

Google

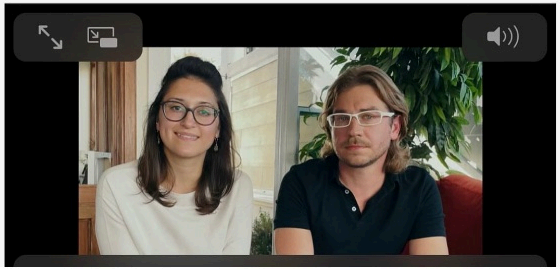
NASA

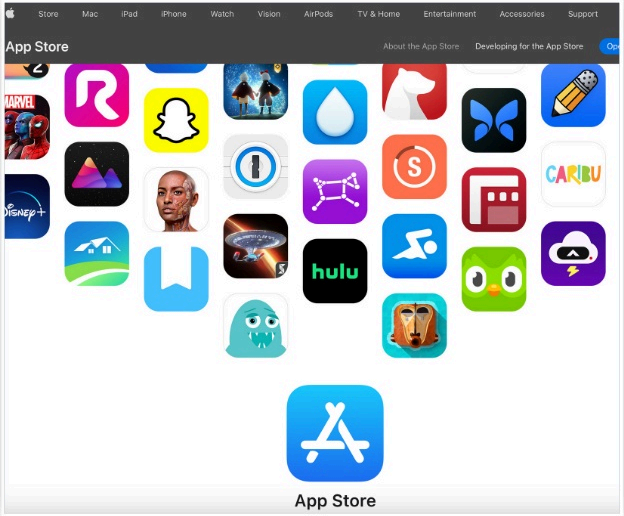
Replate

City of New Orleans

WWDC

June 7, 2021





"The cleanest Startup Grind event we've had."

- Ernie Schmidt, SG host and Redwood City Planning Commissioner.

Rubbish

Tools to clean our shared spaces.

Environment, Waste & EPR Data

Community & Property Management

Education and Outreach

Illegal Dumping Portal

All-in-one stop for waste management software.

Part 1

Illegal Dumping and Environmental Data

Litter & Environmental Data Tracking

The goal of a community survey is to provide an un-biased source of truth and use data to measure and promote a community's progress.

Identify problematic hotspots	Allocate resources equitably	Measure year-over-year progress
Data to apply for gov grants	Track important infrastructure	Comply with regulations (MS4, EPR, etc)

Examples of community improvement issues surveyed in Sacramento, California.

Year over Year Progress

SOMA West 2019 vs 2020

Case Study One

San Francisco, California

“With data collection, ‘the sooner the better’ is always the best answer.” — Marissa Mayer

SOMA West CBD 2019

Rubbish surveyed the issues in the community prior to the launch of services by SOMA West CBD.

This first of its kind survey logged over 28,000 issues in the 100+ block area.

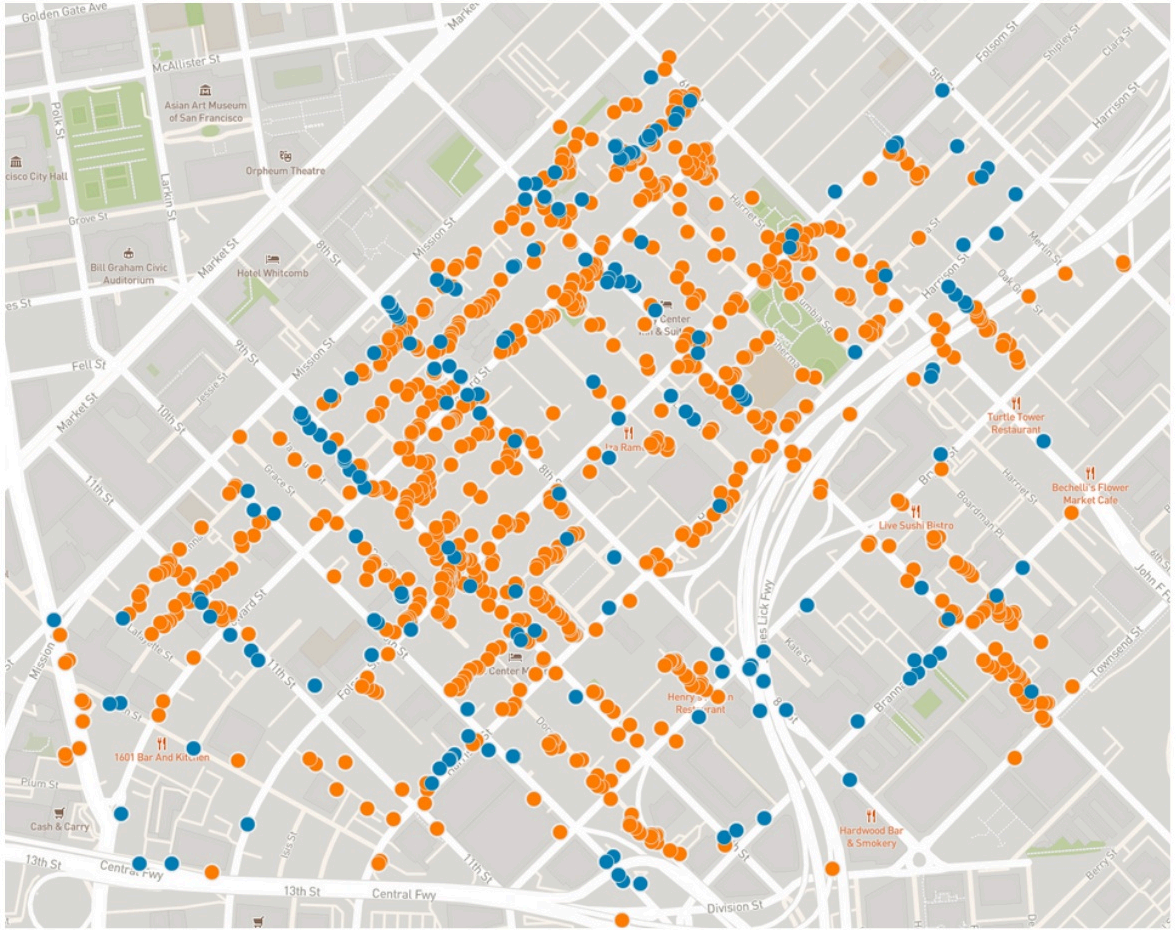
SOMA West CBD Human/Pet Waste Comparison

2019: 1,308 instances
2020: 197 instances

That's a 85% reduction in human/pet waste logged!

2019

2020



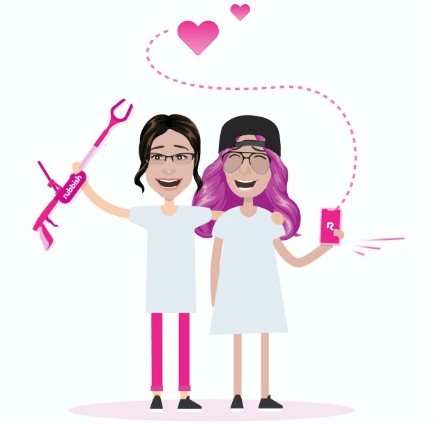
SOMA West Results

Resources were directed where they were needed most

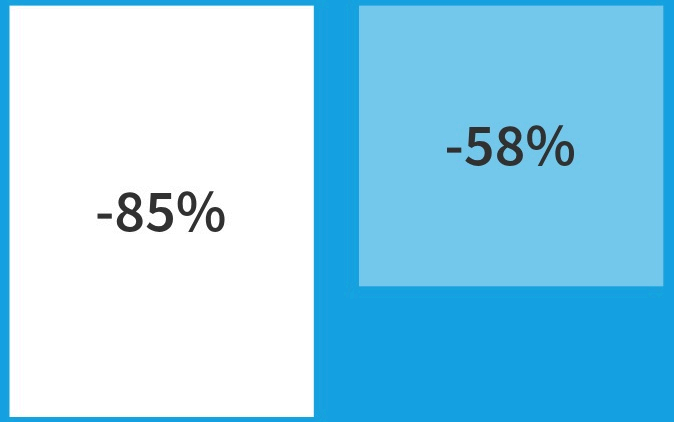
Residents & staff used data to secure grants

Neighborhood action was transparent and accountable

Created Baseline for Improvement



Reduction
2019 vs 2020



River District Snapshot
Sacramento, California

June, 2021

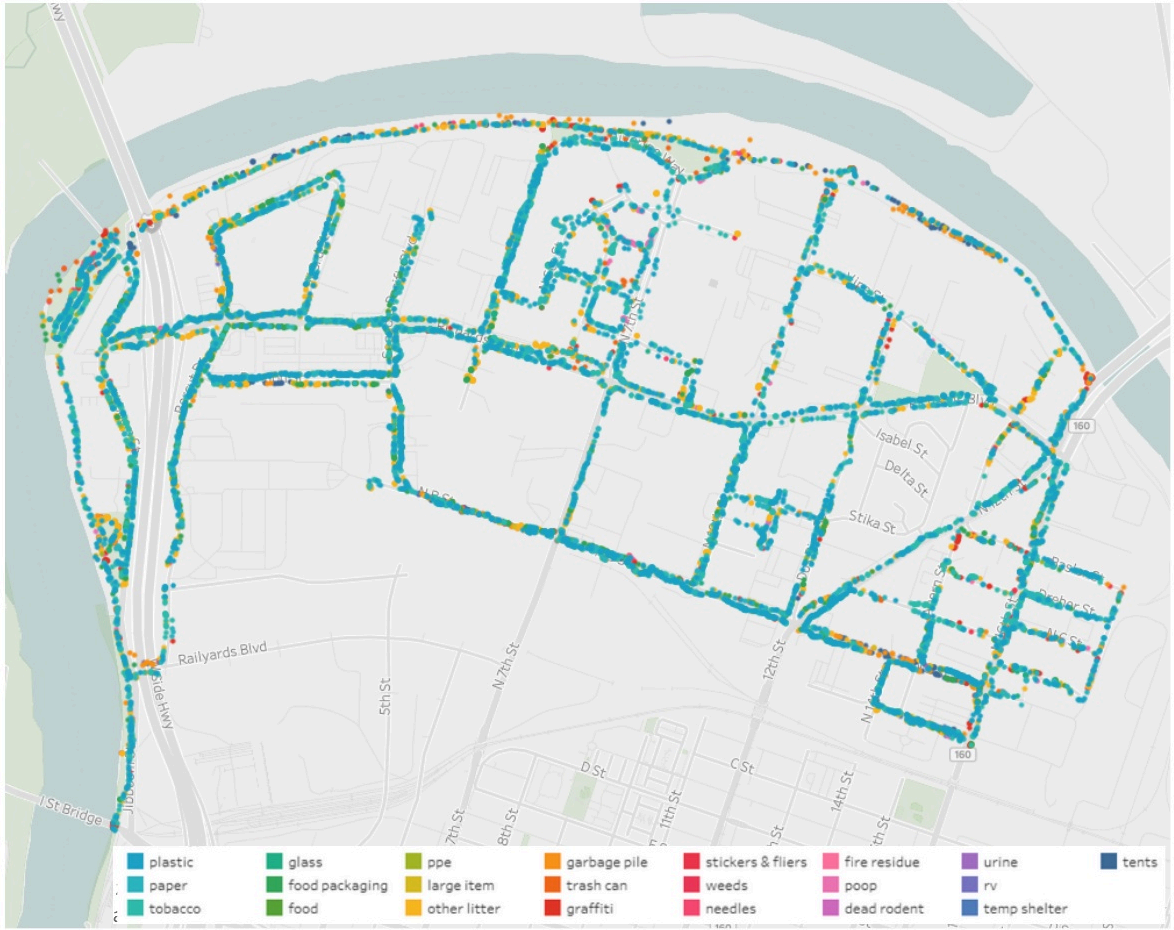
Case Study Two

“Data is a tool for enhancing intuition.” — Hilary Mason

River District
June 2021

The River District audit was conducted from June 6th - June 9th, 2021.

The survey zone extends over approximately 24.5 linear miles.



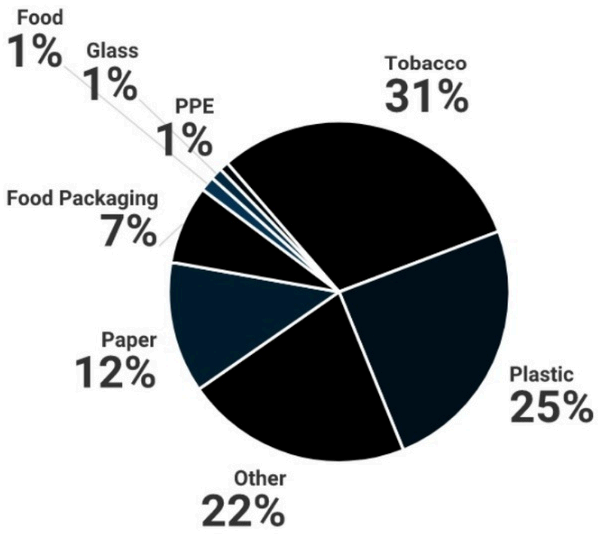
River District
Audited Categories

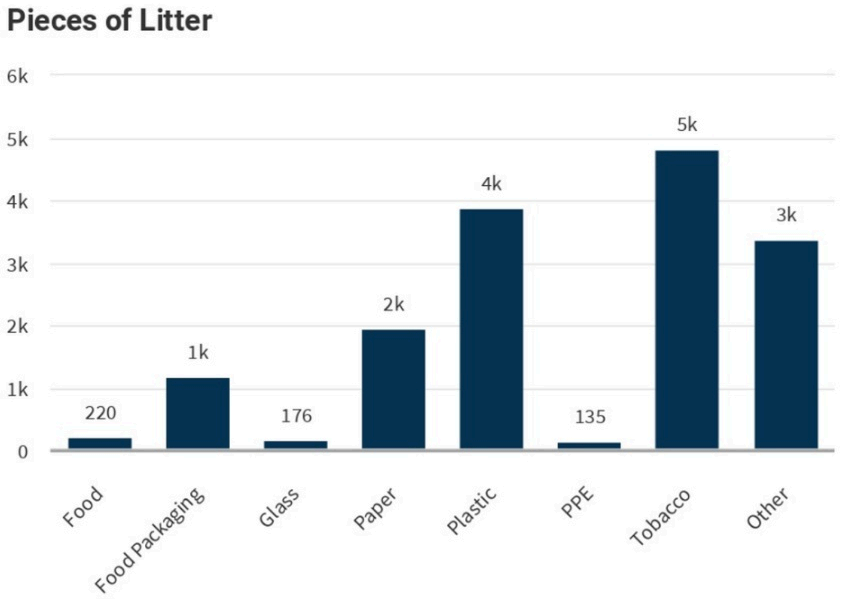
17,035 issues were identified in 12 different categories.

Issue Category	Total
Litter	15,698
Graffiti	339
Temporary Shelters	321
Garbage Piles	227
Poop and Urine	143
Trashcans	75
Fire Residue	72
Stickers and Fliers	70
Large Items	40
Tree Issues and Weeds	32
Needles	15
Dead Rodents	3

River District Street Litter Summary

The small litter group consists of eight types of litter, which each impact the community differently. Tobacco is the biggest culprit of street litter. A new category this year was PPE, which includes disposed masks and gloves.

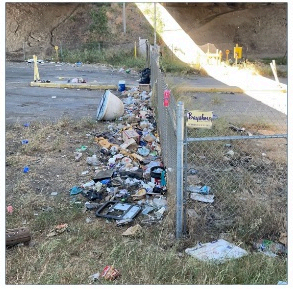


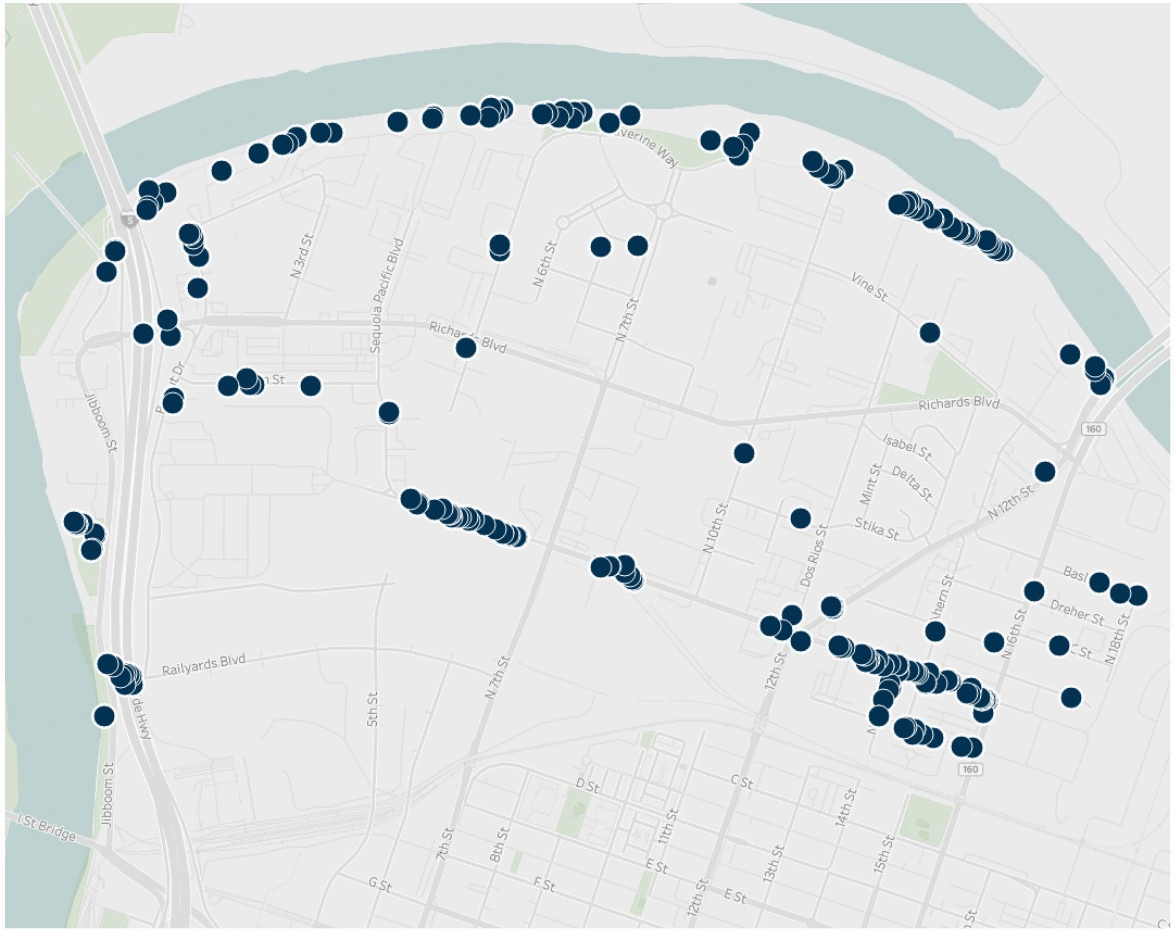


Sacramento, California

River District Garbage Piles

There were **227 instances** of Garbage Piles.





Sacramento, California

River District Tobacco

There were **4,818 instances** of Tobacco.

River District vs Downtown Sacramento
1-Mile Comparison

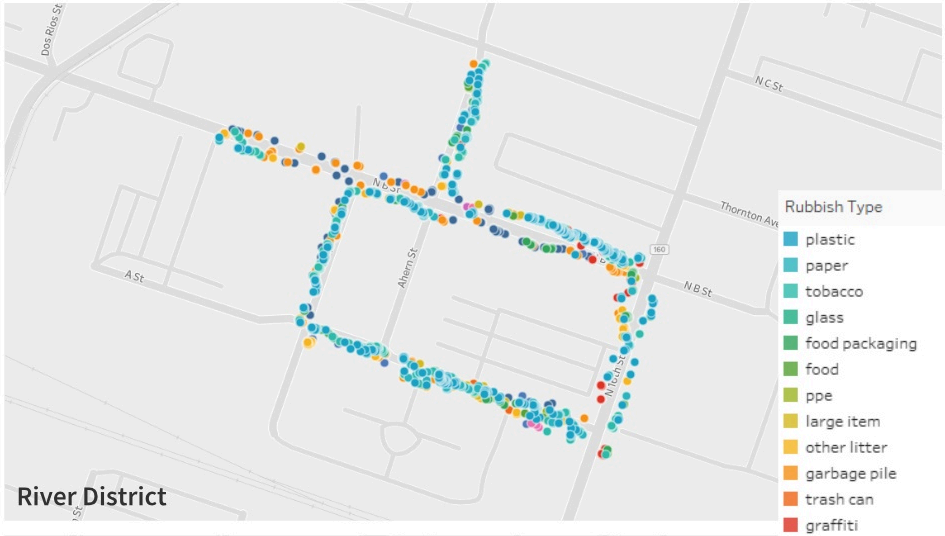
In order to contextualize the River District's challenges,

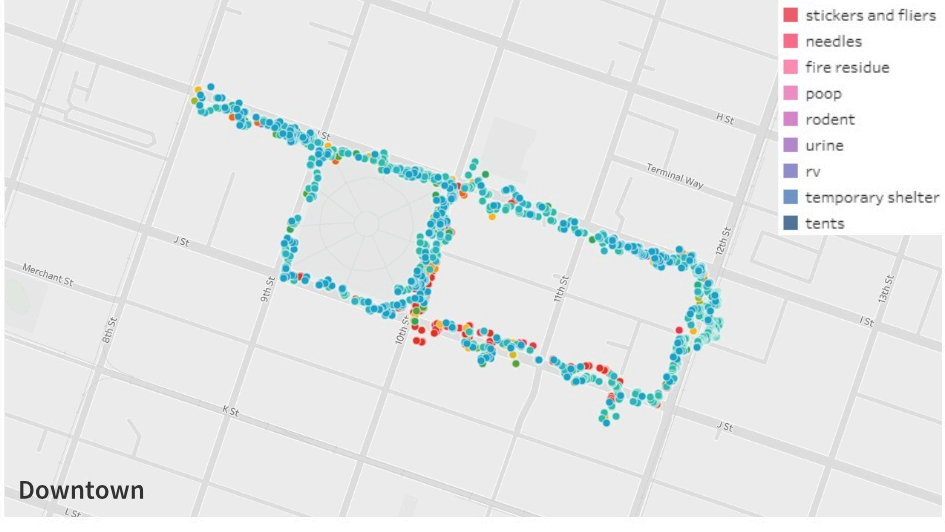
we compared it against a nearby zip code.

River District vs Downtown
1-Mile Comparison

2,591 issues were assessed **in 11 different categories.**

The differences were dramatic...



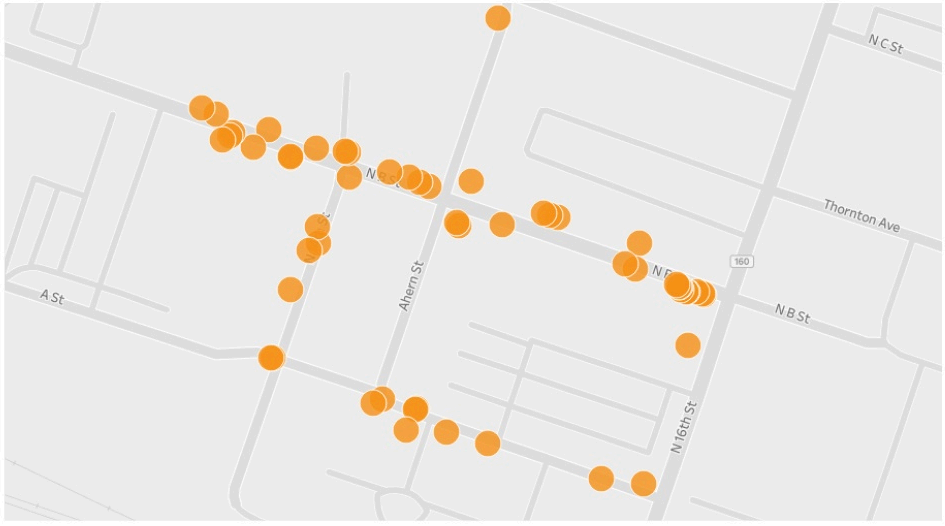


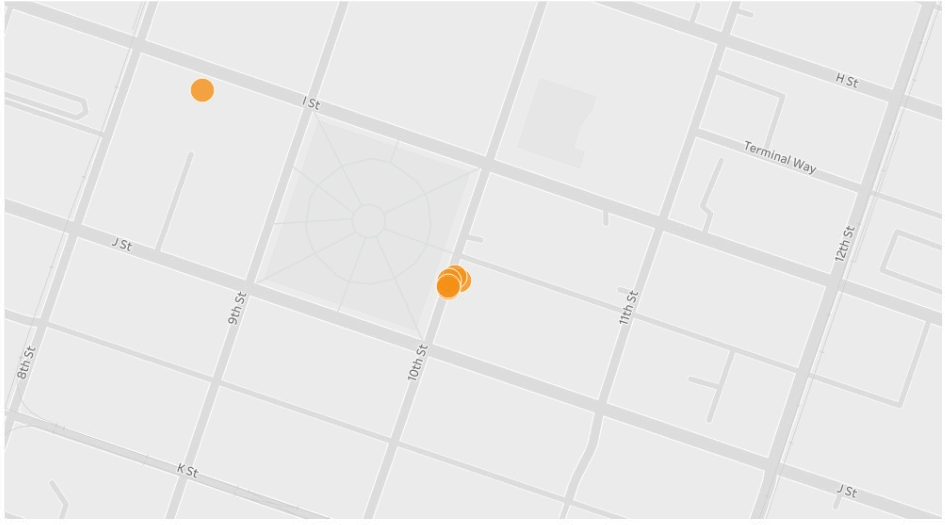
River District vs Downtown Garbage Piles

River District: 54

Downtown: 6

River District has **8x** more Garbage Piles.





Testimonial

“This report is really something that we’ve never had before. I would do it again in a heartbeat.”

“It gave us a full picture of the magnitude of the issues we are challenged with.”

“This is our Ground Zero and this will be used to show our improvement year-over-year as we go forward.”

Read full article: www.rubbish.love/blog/sacramento-river-district-audit

Jenna Abbott, Executive Director
Sacramento River District Business Improvement District

Cal Recycle, Cascadia, KAB & Rubbish California Trial

Our first live test of AI for Environmental Data

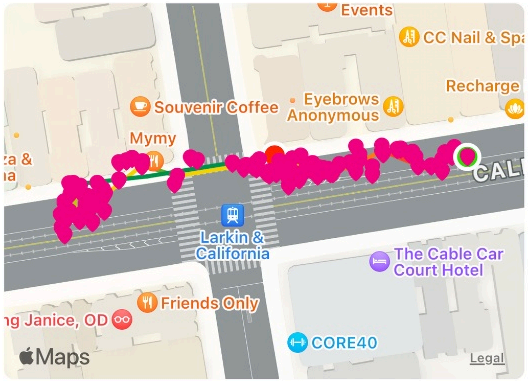
December 2023

Rubbish Run Summary

done

Nob Hill

@russianhill public



00:06:44 | 0.10 mi | 15.7 LPM

Leave a short note...

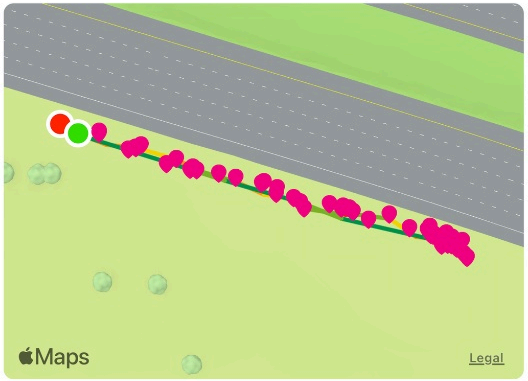
Breakdown

Rubbish Run Summary

done

Belmont Heights

@russianhill public



00:07:36 | 0.12 mi | 6.0 LPM

Leave a short note...

Breakdown

Rubbish Run Summary

done

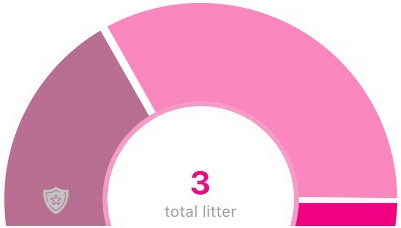
Montara

@russianhill public

00:09:22 | 0.11 mi | 0.3 LPM

Leave a short note...

Breakdown



86/222 Finish

174/222 Finish

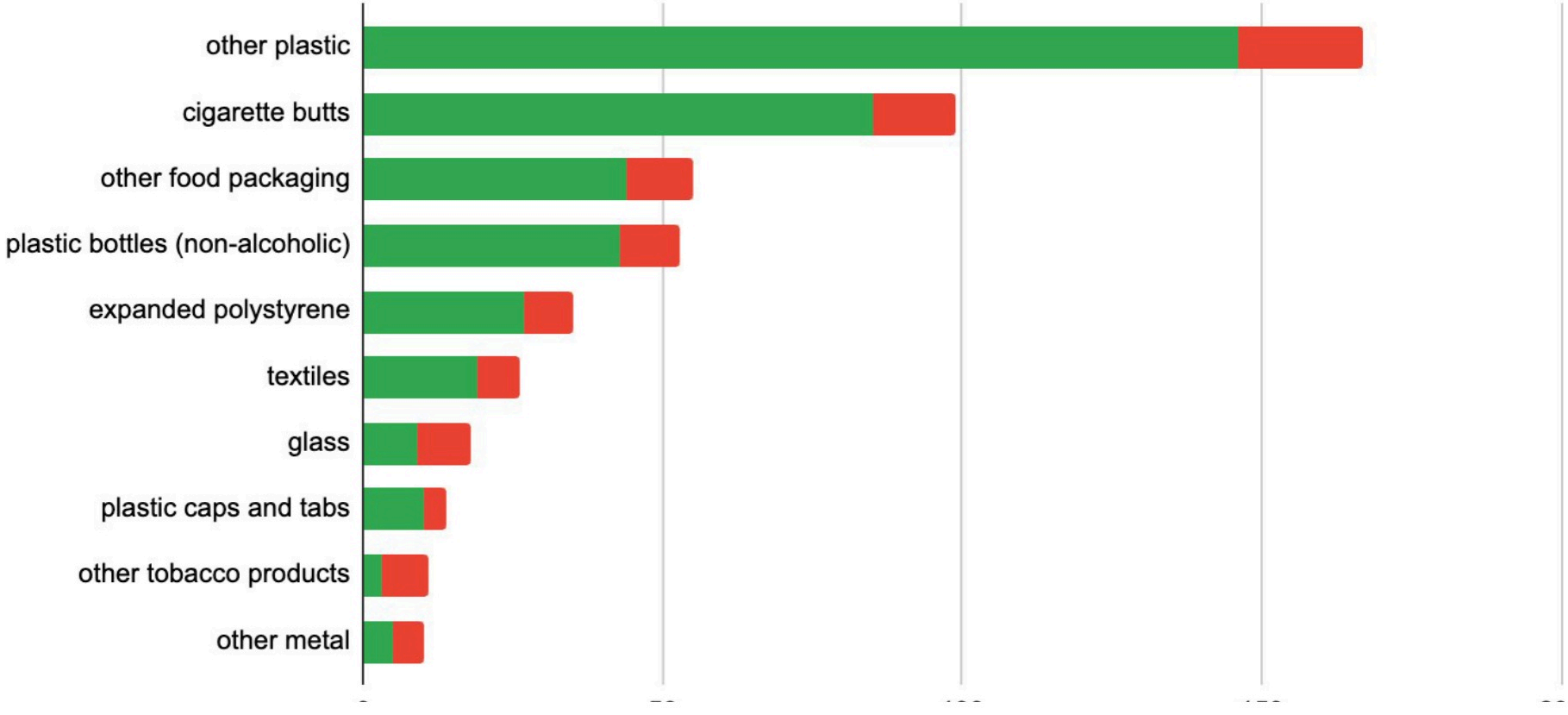
197/222 Finish

09:24 AM 12/07/2023
@docdavescott
ai
Expanded polystyrene
E Telegraph Rd
Picked up

09:24 AM 12/07/2023
@docdavescott
ai
Textiles
E Telegraph Rd
Picked up

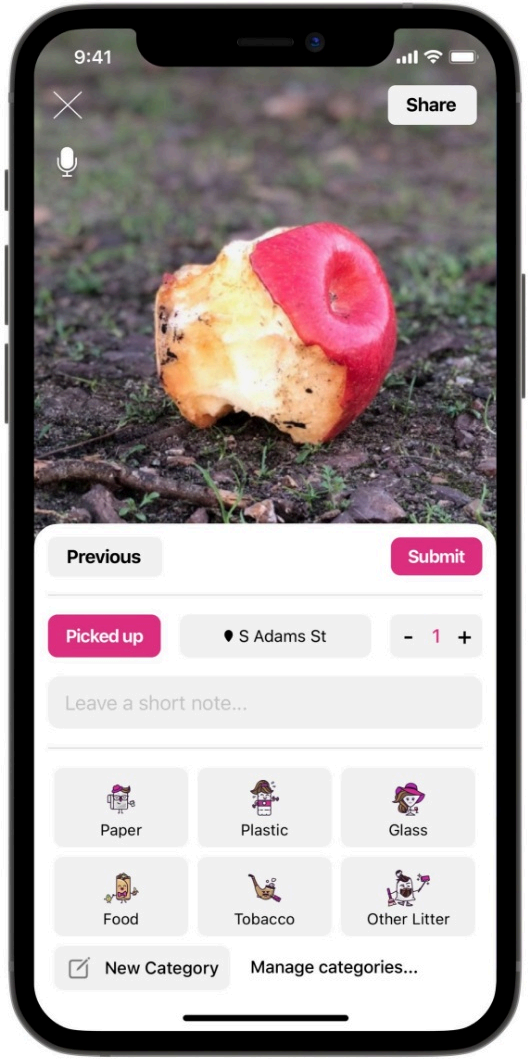
@docdavescott
ai
Glass
E Telegraph Rd
Picked up

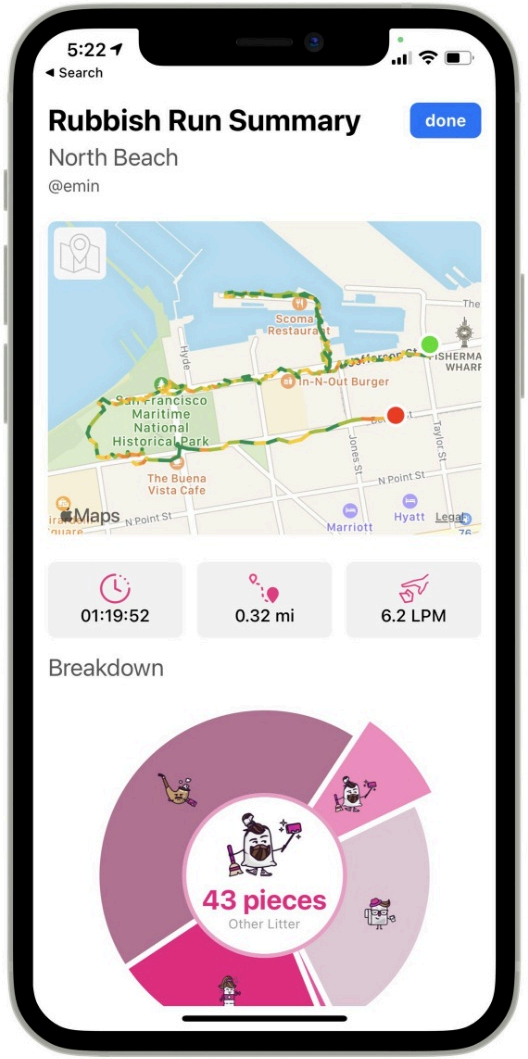
AI Model Accuracy Rates >85%



Rubbish iOS App

Demo TIME!





ai
ECOENCLOSE
YouTube
recycling bin as

What does AI unlock?

- **Signicantly faster data collection and characterization**
- **Automates repetive tasks**
- **More accessible**
  Audio feedback, multilingual support, cheaper
- **Less bias in collection***
  Bias is more explicit, consistent, controllable

Rubbish Recycles

Up-to-date recycling information, wherever you go.

Problem: People Suck at Recycling. But it's not their fault!

AI in Recycling, Composting, and Recovery

Goals

Simplify disposal instructions.

Make recycling fun.

Tailor instructions by region.

Centralize constantly evolving legislations.

Contamination detection.

Comply with Local Laws

Senate Bill – 54: Plastic Prevention and Packaging Producer Responsibility.

Senate Bill – 1383: Organic Waste Reduction

Extended Producer Responsibility (EPR)

Snap & Categorize

Trash, Recycling, Compost, Hazardous, eWaste

AI will even give dissasemble instructions!

Chicken:
Compost

Plastic Container:
Recycling**

*Must wash and clean first.

**According to Recology SF

*** Not actually recyclable.

Paper:
Recycling

Local Disposal Guidelines

Specific guidance for each community.

Link to local inforamtion and programs

Track EPR Data

Mattresses

Paint Cans

AI Categorization in Progress...

Code Enforment AI

Automate Routine, Focus on Human Interaction

Code Compliance Assistance

Match a photo to a code.

Use AI to pre-fill form details.

Automate the boring parts so officers can focus on the human interaction.

Customizable to each county.

Example Use Case

Detect Weight & Quantity

Auto-categorize illegal dumping based on severarity.

Works with existing systems, like 311, and can pre-screen or route issues.

AI in the Near Future

6 - 24 month predictions

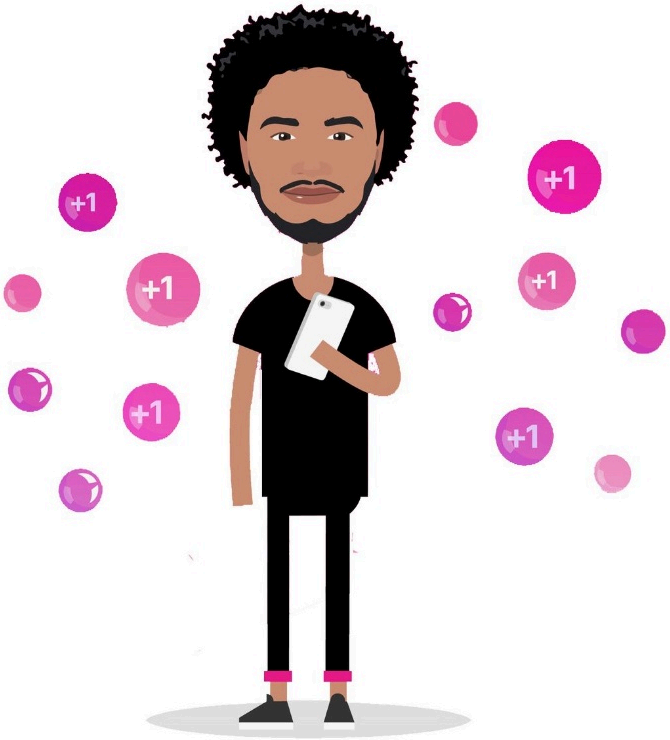
Better, Faster, Cheaper

Increased accuracy, >95%

Better at counting & estimating large numbers

Prefill forms based on photos

Under 2 second processing time



rubbish

Love where you live

iOS Try it now!
Web coming soon.

emin@rubbish.love
www.rubbish.love

Emin & Team
from rubbish with love

Your feedback helps us improve

1:00 pm Pacific Time
October 3, 2024

Track B

Annette Poliwka

Board Member

League to Save Lake Tahoe (aka, Keep Tahoe Blue)

The Power of Tech in Litter Abatement

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Marilee Movius

Senior Community Engagement Manager

League to Save Lake Tahoe (aka Keep Tahoe Blue)

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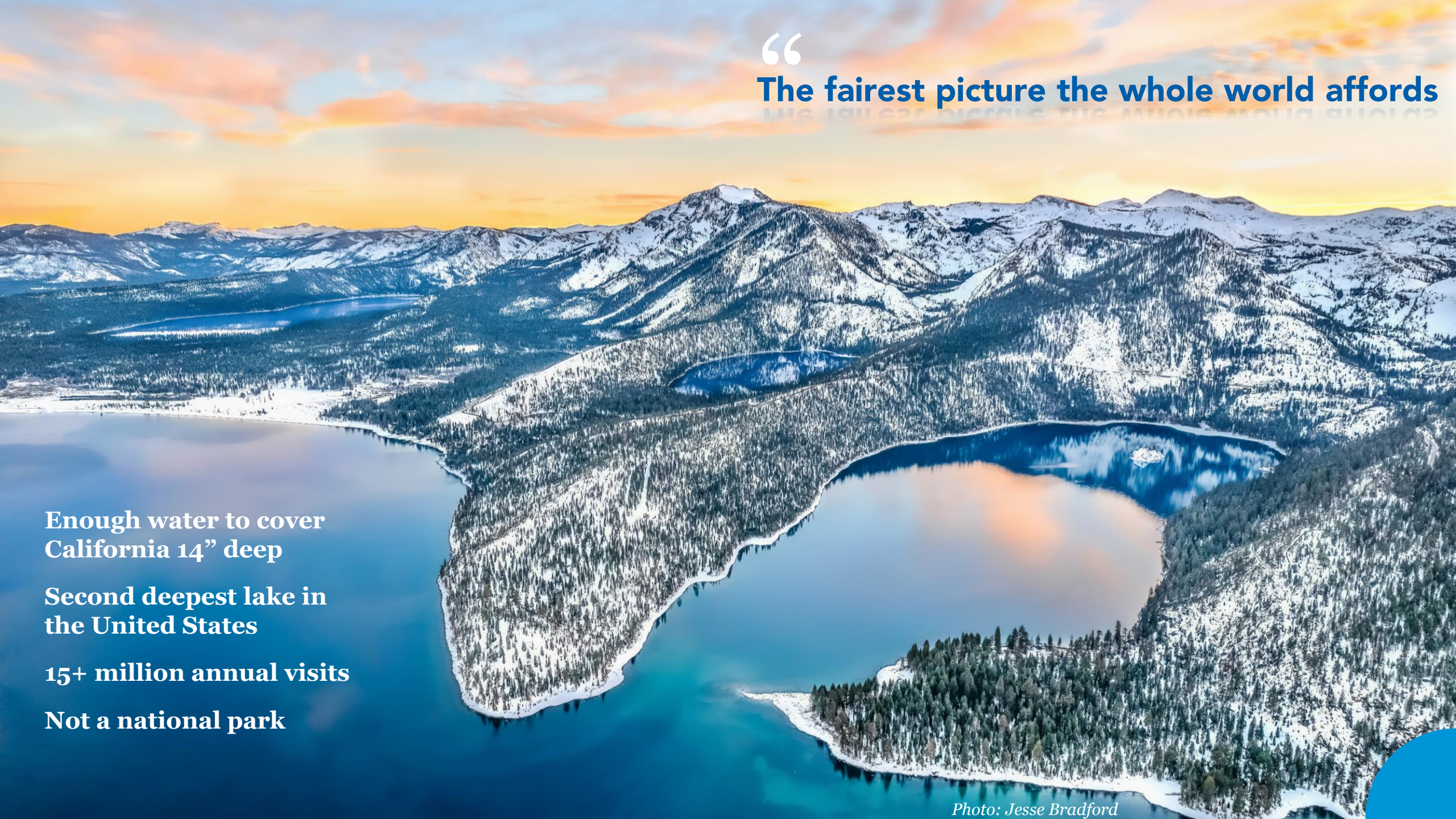
Innovation for Tahoe Litter Solutions



“The fairest picture the whole world affords

Enough water to cover California 14” deep

Second deepest lake in the United States

15+ million annual visits

Not a national park

Photo: Jesse Bradford

KEEP TAHOE BLUE®

League to Save Lake Tahoe

We are the donor-funded organization of environmental experts and Tahoe-lovers who have been keeping Tahoe blue since 1957.

1 Repeat Litter Offenders

2 Loving Tahoe to Death

3 Plastic Problem

Lake Tahoe's Land Litter

Recap of data collected at Keep Tahoe Blue cleanups, 2014-2024

KEEP TAHOE BLUE®
League to Save Lake Tahoe

Top litter items by count

- Cigarette butts **253,000**
- Miscellaneous plastic pieces **186,000**
- Plastic food wrappers **77,000**
- Miscellaneous paper pieces **75,000**
- Metal cans/tabs **58,000**

2,100+
Volunteer-powered cleanup events

105,000+
Pounds of trash removed

1,065,000+
Litter items collected

Plastics by category

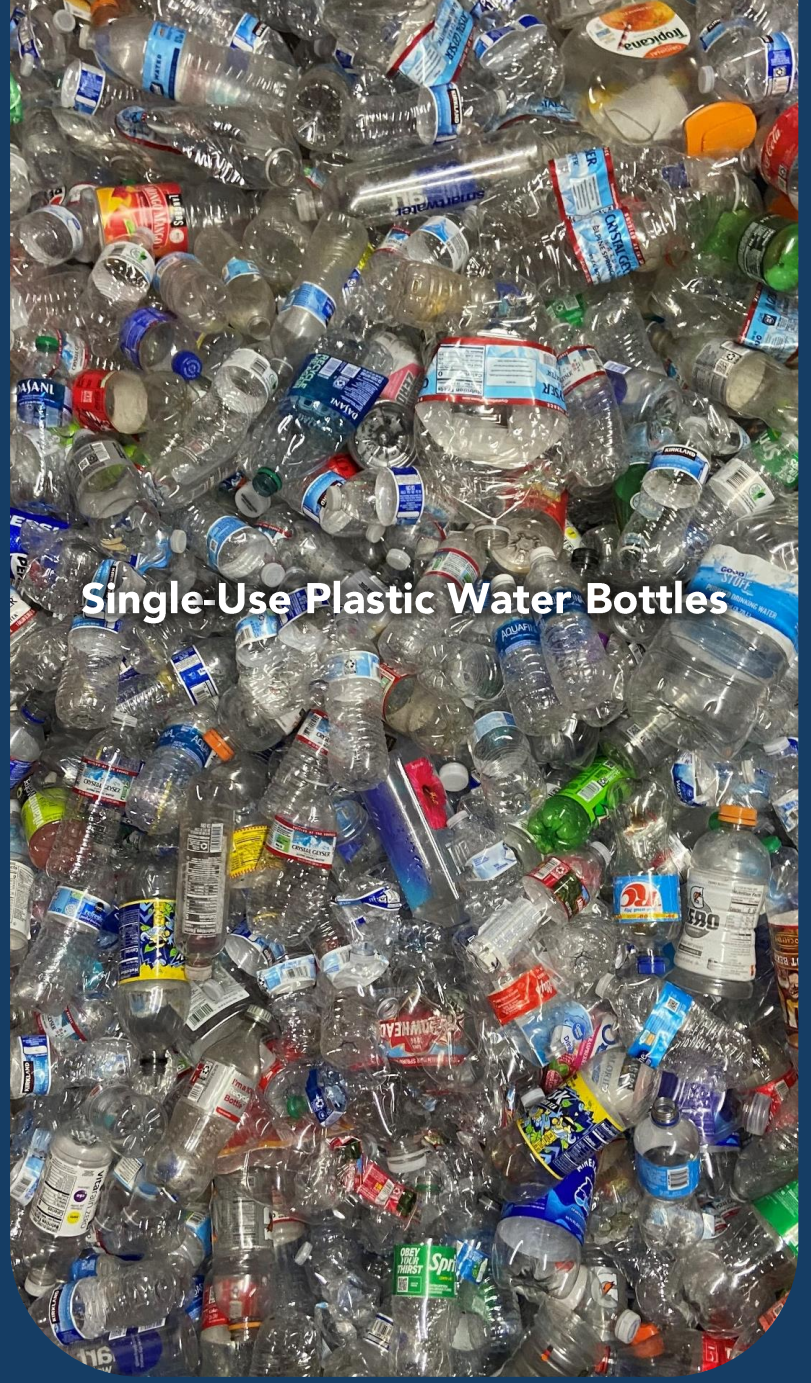
1 Bans on Common Litter Items

Data for Policy Change

Plastic Bags

Polystyrene

Single-Use Plastic Water Bottles



2 Tahoe Blue Beaches

Innovative Management

3 Beach-cleaning robots

Testing & Scaling Tech

1. Repeat Litter Offenders

Data for Policy Change

Litter Bans

2. Loving Tahoe to Death

Innovative Management

Tahoe Blue Beaches

3. Plastic Problem

Testing & Scaling Tech

Beach-cleaning robots

KEEP TAHOE BLUE®

League to Save Lake Tahoe

Thank You

info@keeptahoeblue.org
keeptahoeblue.org
@keeptahoeblue

1:00 pm Pacific Time
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Track B

JoAnn Gemenden

Executive Director

NJ Clean Communities

The Power of Tech in Litter Abatement

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Introduction www.njclean.org

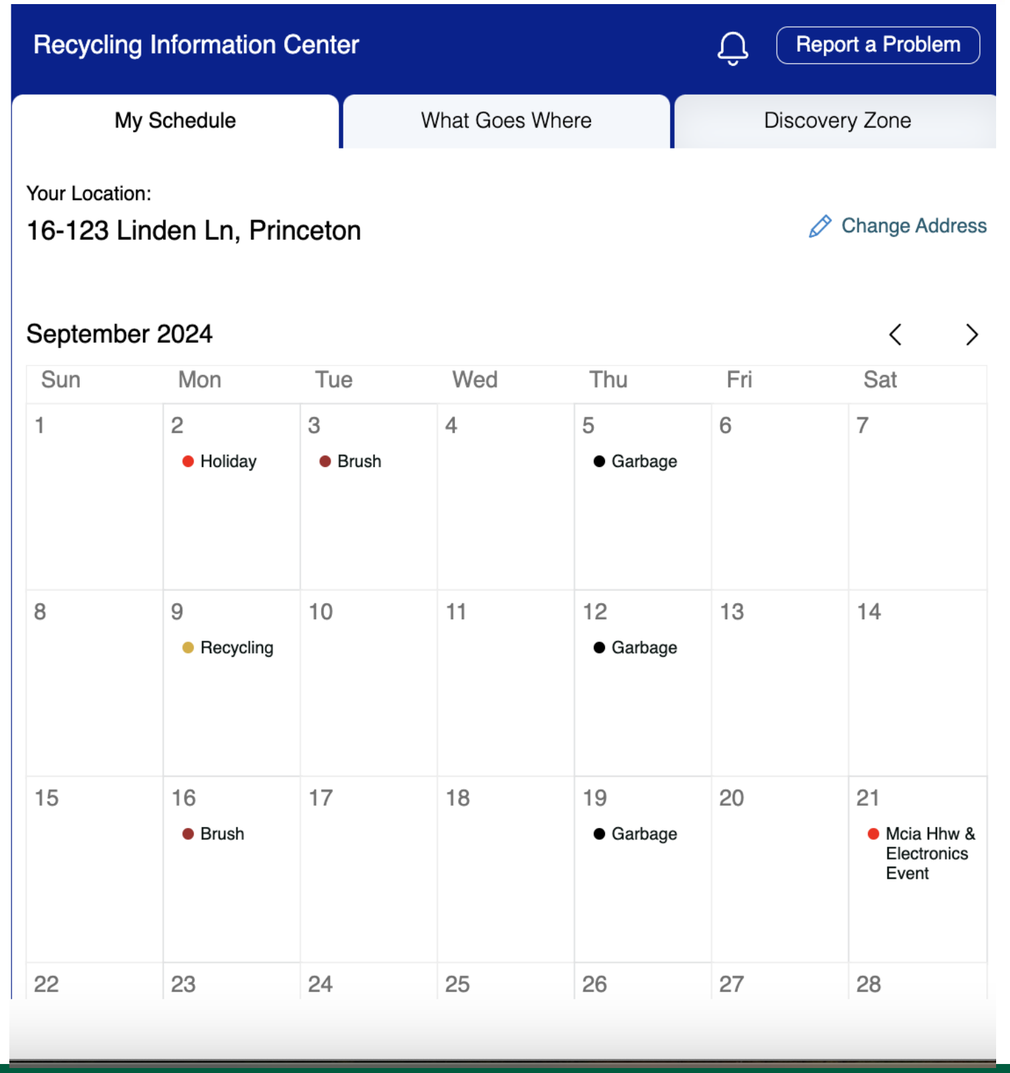
New Jersey Clean Communities is a statewide, non-profit litter-abatement program created by the passage of the Clean Communities Act in 1986. The Act provides a funding source for the program by placing a tax on fifteen categories of businesses that produce/sell litter-generating products.

Clean Communities legislation was passed in 1986 and **became NJ's first EPR Act.**

In 2020, NJCCC was included in NJ's Single Use Plastics legislation & given the responsibility for developing statewide education and outreach.

NJ Launches Recycle Coach

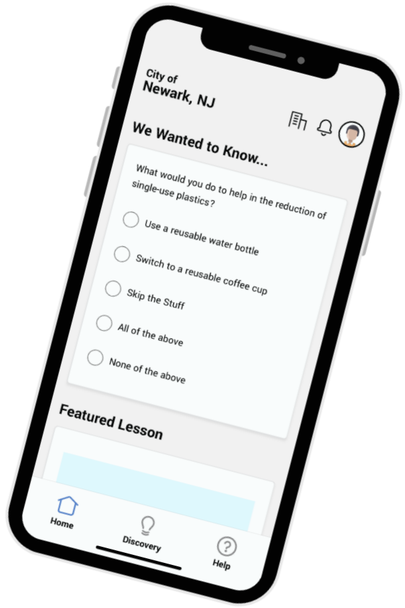
In 2017, NJDEP purchased the Recycle Coach app for use by all counties and towns. It offers residents detailed information about their local recycling programs, waste disposal guidelines, and a *"What Goes Where" tool.*



Using Digital Technology to Combat Litter

NJCCC integrated Recycle Coach to promote litter prevention actions, advertise community clean-up events, educational workshops, and other litter abatement programs.

This helped boost volunteer participation and community involvement.



Focus Areas

- ❑ Cleanup
- ❑ Enforcement
- ❑ Education
  - ✓ General Litter
  - ✓ Cigarette Butts
  - ✓ Balloon Releases
  - ✓ Single Use Plastics
  - ✓ Reusable Bags

Litter Abatement Custom Content Program

12-month State-Wide program

Sponsored by NJ Clean Communities

2023-2024

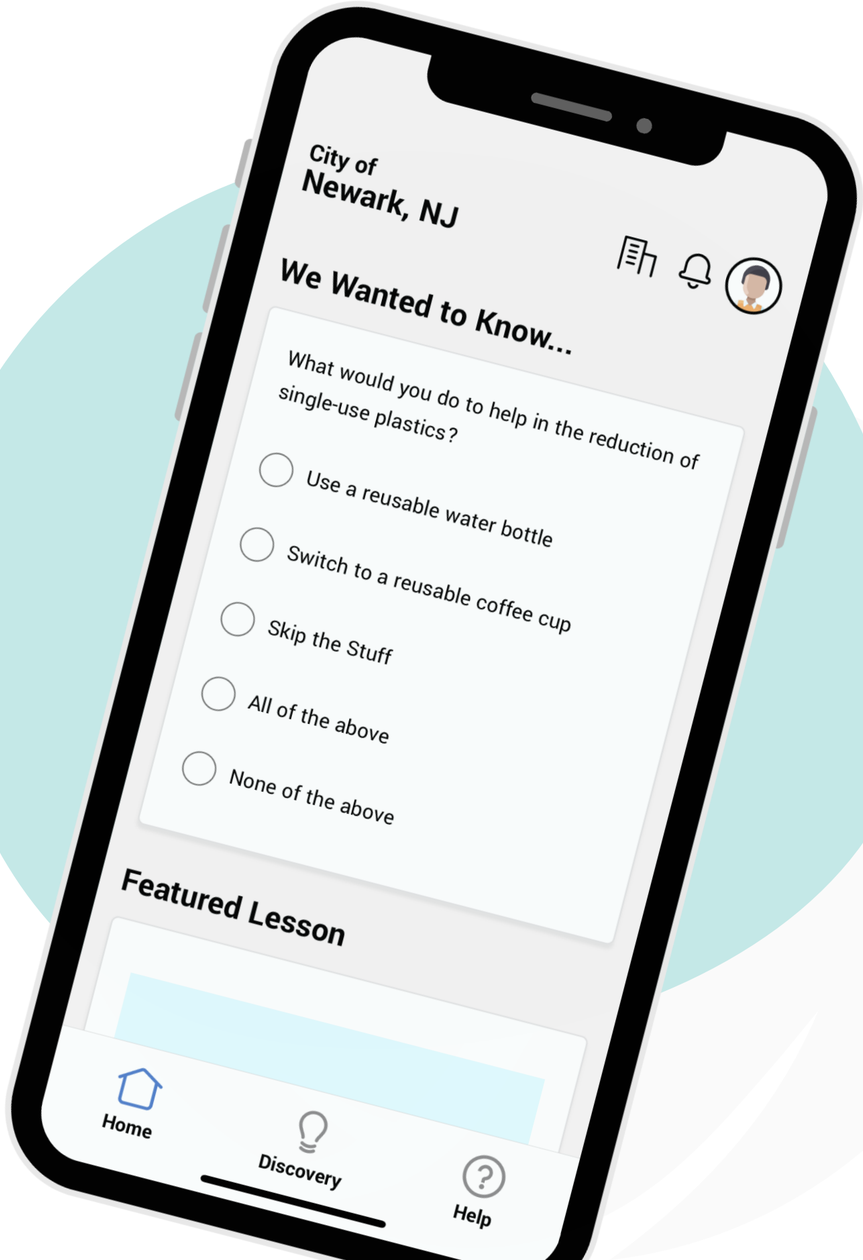
Customized Quiz Questions for Web App

Question 1: What would you do to help in the reduction of single-use plastics?
4.82k Users Participated

Question 2: Are you remembering to bring your reusable bag every time you shop?
7.42k Users Participated

Question 3: Did you know balloons can often travel up to 1,400 miles and land in waterways or the ocean causing litter? Instead of a balloon release at your next celebration, which of these sustainable alternatives are you most interested in trying?
11.35k Users Participated

Question 4 : TRUE or FALSE: One of the leading contributors to ocean microplastic pollution is microfibers that are broken off of clothing during agitation in laundry machines.
5.8k Users Participated



Learning Modules

Benefits of the NJ Bag Law

18.1k Users

45.6k Engagements

Residents watch the NJ video then engage with poll and quiz questions about changes in plastic bag usage in NJ.

The Problem with Microfibers

18k Users

40.3k Engagements

Residents engage with a photo gallery explaining the effects of microfiber plastic pollution and how to reduce impacts in their home.

Balloon Releases

8.13k Users

17.9k Engagements

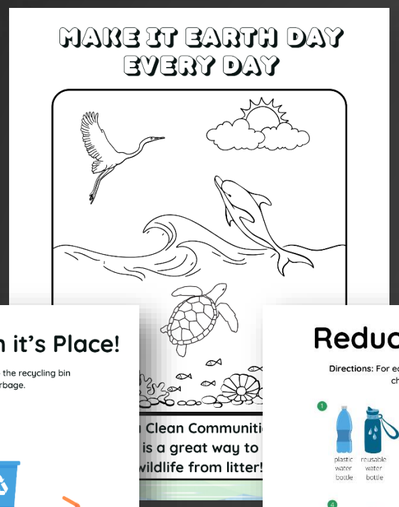
Residents learn about issues with balloon release litter and are provided with sustainable alternatives.

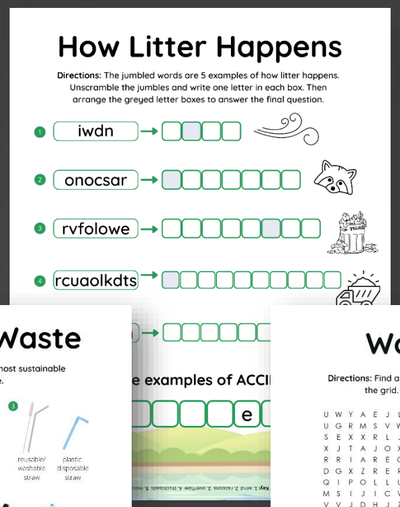
Community Pledge

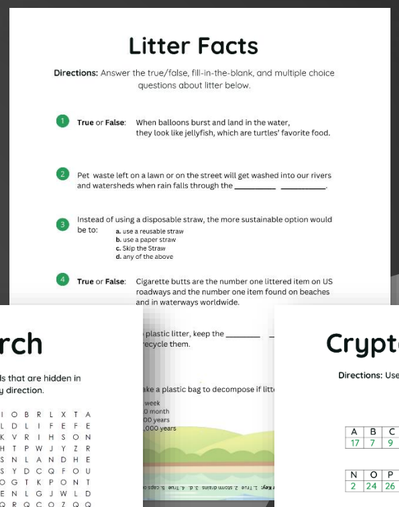
Pledge	# of Users that pledged	% of respondents that pledged
I pledge to reduce my plastic waste by bringing reusable bags every time I shop.	3576	92%
I pledge to keep New Jersey clean by not littering.	3763	98%
I pledge to avoid single-use plastics.	3145	82%
I am dedicated to reducing microfibers in my laundry by reducing the amount of water used. I will do this with a combination of washing on cold, avoiding delicate cycles, doing laundry less often, and/or washing full loads.	2810	90%
I will no longer release balloons.	2938	92%
I will practice sustainable alternatives to enhance my gatherings, such as blowing bubbles, playing music, or planting a tree.	2408	81%

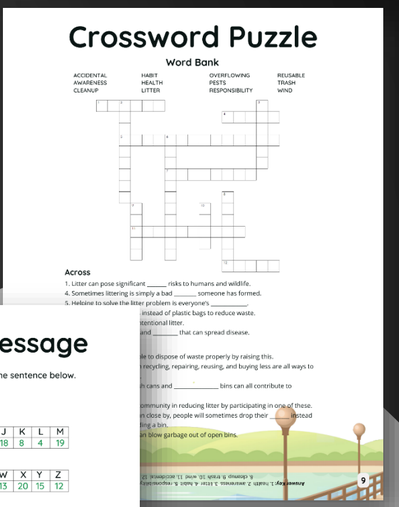
New Jersey Clean Communities is New Jersey's only Statewide, Comprehensive, Litter-Abatement Program

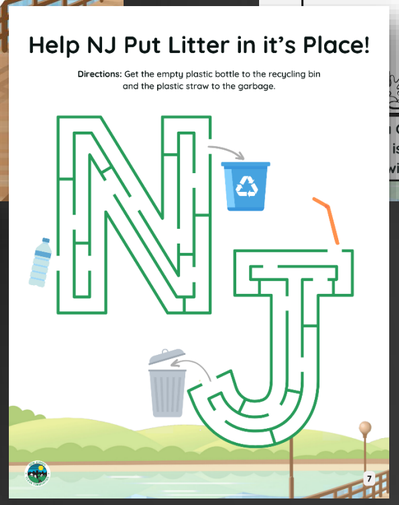
ACTIVITY PACKS – ENGAGE AT AN EARLY AGE

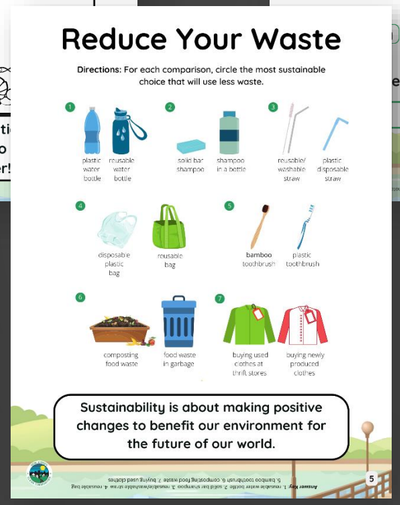


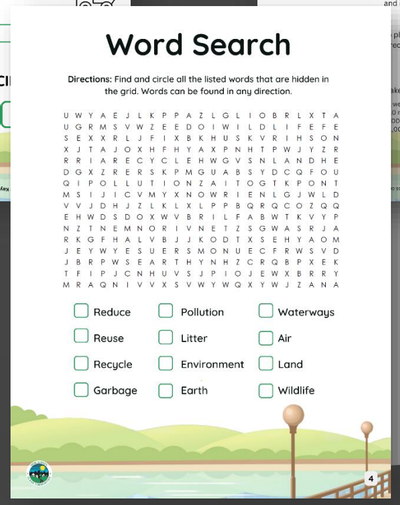


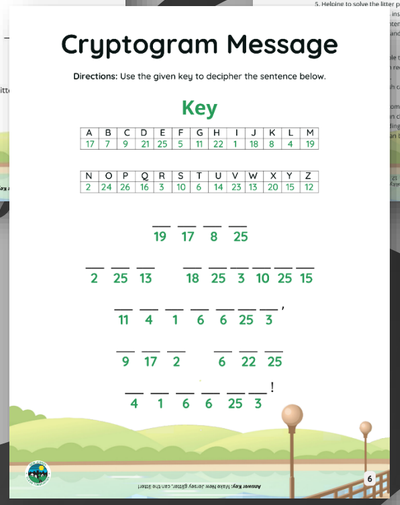








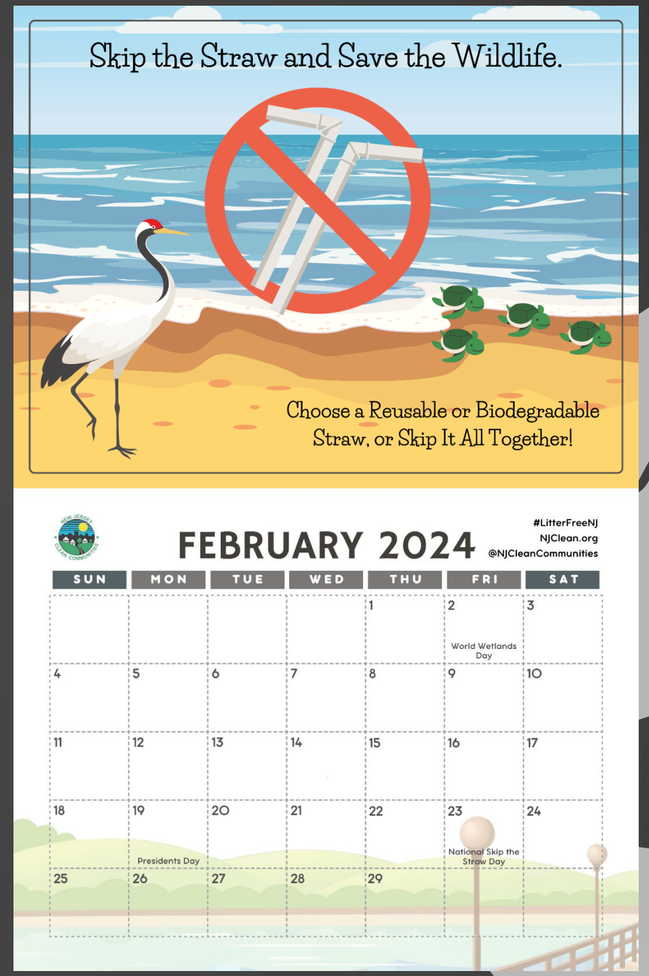




Live on Web App and used as a community resource for any CC Coordinator

12-MONTH WALL CALENDAR

Live on Web App and used as a community resource for any CC Coordinator



Municipalities Can Add Their Own Content And Event Sign Up

INTRODUCING

CLEAN COMMUNITIES PACKAGES

WITH RECYCLE COACH

recycle coach

Recycle Coach in partnership with NJ Clean Communities, announces new packages available to local communities.

*"We're excited to partner with Recycle Coach to bring local solutions to Clean Communities Coordinators. Leveraging this interactive platform that over two million residents in New Jersey use every year is a perfect way to articulate your local Clean Communities strategy. Recycle Coach has innovated on two packages for your consideration to help bring awareness to litter reduction, clean-up events, and single use plastic education." - **JoAnn Gemenden, Executive Director***

Our technology is so much more than just a calendar.
It's a game changer.

Reach out to Kim Stuart at kstuart @recyclecoach.com or 1-855-343-3363 x121 to hear more about our programs for Clean Communities.

Education Programming Package

Educate your residents about litter abatement by adding this package to your existing plan.

4-Part Video Series

Empower residents on the importance of litter reduction through a 4-part video series.

Digital Badge for Residents

Motivate residents with a digital badge to display their commitment to reducing litter.

12 Monthly Featured Lessons

Engage residents through monthly interactive lessons and gamification of educational content.

Marketing Support Package

Promote education through our custom marketing package designed to encourage resident participation and user acquisition.

Population	0-30k	30-50k	50-75k	75-200k	200-500k	500k+
Investment	$ 2,000	$ 3,000	$ 4,500	$ 5,200	$ 6,000	$ 7,500

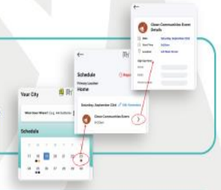
Please note, images are for reference only.

Communications Package

Deploy this robust communications plan empowering your residents to become involved in Clean Communities events.

In App Event Sign-Ups

Simplify Clean Community event sign-ups by making them available on the Recycle Coach App.



Enhanced Notifications Roadmap

Reach more residents with push notifications about Clean Communities events and information that encourage sign-ups.

Promotional Event Flyers

Increase awareness by adding a promotional event flyer to calendars downloaded by residents

Social Media Communications Plan

Bolster your messaging to residents with an established social media communications plan built to increase engagement and participation.

Population	0-30k	30-50k	50-75k	75-200k	200-500k	500k+
Investment	$ 1,000	$ 1,500	$ 2,250	$ 2,600	$ 3,000	$ 3,750

Please note, images are for reference only.

Topic Engagements and Exposures

This is the measurement of all engagements and exposures to the topic of Litter and Reducing Plastic Waste from October 2023 through today. This shows how many times all New Jersey residents have interacted with these topics across all content over the course of the program.

Litter

123k Engagements
1.6m Impressions

Reducing Plastic Waste

38.2k Engagements
524k Impressions

Summary of Collaborative Benefits

Statewide Consistency:

Utilizing Recycle Coach ensures that all municipalities within New Jersey have access to the same quality of information and tools, promoting a unified approach to recycling and litter reduction across the state.

Cost-Effective Outreach:

Digital platforms like Recycle Coach offer a cost-effective means for NJCCC to reach a broader audience without the extensive expenses associated with traditional marketing and educational campaigns.

Check out our PSAs...

General Litter

Cigarette Litter

Balloon Litter

AVAILABLE AT
LITTER FREE NJ

Reusable Bag Resource Center

coming soon!

THANK YOU

JoAnn Gemenden
jgemenden@njclean.org