

# Circularity Assessment Protocol

## PANAMA CITY, PANAMA



# Foreword

The Circularity Assessment Protocol (CAP) was born out of an effort to define the concept of the circular economy in our cities and communities. While plastic pollution continues to be discussed at the highest levels of government and global organizations, cities and communities are the front lines. CAP is conducted where requested, where a city is engaged in the process. Local knowledge and expertise are the foundation of the information that the community uses, with additional data collected in partnership with CAP collaborators. Partners and teams build capacity through learning methods together. Open data collection is an important part of the process; leakage data contributes to a global open dataset. Trends across cities, countries and regions can illuminate global narratives.

Data is power to communities and enterprising individuals who are recognized for their role in materials management through CAP but are often marginalized in society. CAP data can catalyze economic development through business opportunities and subsequent interventions. The issue of plastic pollution is not for outsiders to solve in other locations, but for communities to address by collaboratively collecting data to lead themselves through the context-sensitive design of their own desired circular economy. Communities are empowered by local and global CAP data to inform their decisions about what is working, or where and how to intervene to increase circularity. Communities that participate in CAP can better define resource needs and participate in knowledge exchange.

Urban Ocean, a partnership of The Circulate Initiative, Resilient Cities Network and Ocean Conservancy, works with city leaders to bring new ideas, partners and resources together to solve interrelated problems around materials management, including addressing key priorities such as public health and economic development. A critical step in the Urban Ocean process is the Gap Assessment, which maps challenges, risks, and vulnerabilities within materials management systems and helps to develop a unique, integrated picture of the materials and circular economy related challenges and opportunities faced by each city. The CAP, developed in our Circularity Informatics Lab (CIL) at the University of Georgia, was chosen as the ideal tool to deploy as part of the Urban Ocean Gap Assessment.

The interconnected nature of complex urban systems and the value of circular economy in building resilient cities was starkly evident when the COVID-19 pandemic began just following the launch of the first Urban Ocean cohort. As a team, we immediately transitioned to online global work, with our local implementation partners becoming even deeper collaborators, conducting all field work with virtual training. This allowed for embedded ownership of the data at the local level and ultimately a powerful network of collaborators and supporters across learning cities to drive scientifically informed decision making. Local implementation partners have then continued to work with the Urban Ocean team through stakeholder workshops and into the proposal phase, as advocates for the science and key contributors in their own cities.

Urban Ocean and its partnerships provide an ideal platform to support resilient cities. CAP data can help guide interventions, create a baseline to measure success, and put essential data in the hands of the local community to drive change. We believe piecemeal solutions that are not contextually grounded are insufficient to create a systemic shift. Communities need to be involved, not just as stakeholders, but as the powerful change-makers they are.

**— Jambeck Research Group, Circularity Informatics Lab, University of Georgia**

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The Circularity Informatics Lab at the University of Georgia is committed to information sharing, data analytics, empowering communities, and systems change related to circular materials management.

**Published by:**

The Circularity Informatics Lab (CIL)

**Location:**

New Materials Institute

University of Georgia

Athens, GA

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**Recommended Citation:**

Circularity Informatics Lab, June 2021. Circularity Assessment: Panama City, Panama. University of Georgia, Athens, GA, USA.

**Design/Layout:**

Deeds Creative, Athens GA

**Photo Credits:**

Page 25, 26, 27, 28, 29, 36, 39: CEASPA

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**On behalf of:**

The Urban Ocean Program, a three-way cooperative partnership among The Circulate Initiative (TCI), Ocean Conservancy (OC), and Resilient Cities Network (RCities). Funding for this work was provided by TCI.

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Athens, GA, June 2021



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Initiative



CITIES  
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ALCALDÍA DE PANAMÁ

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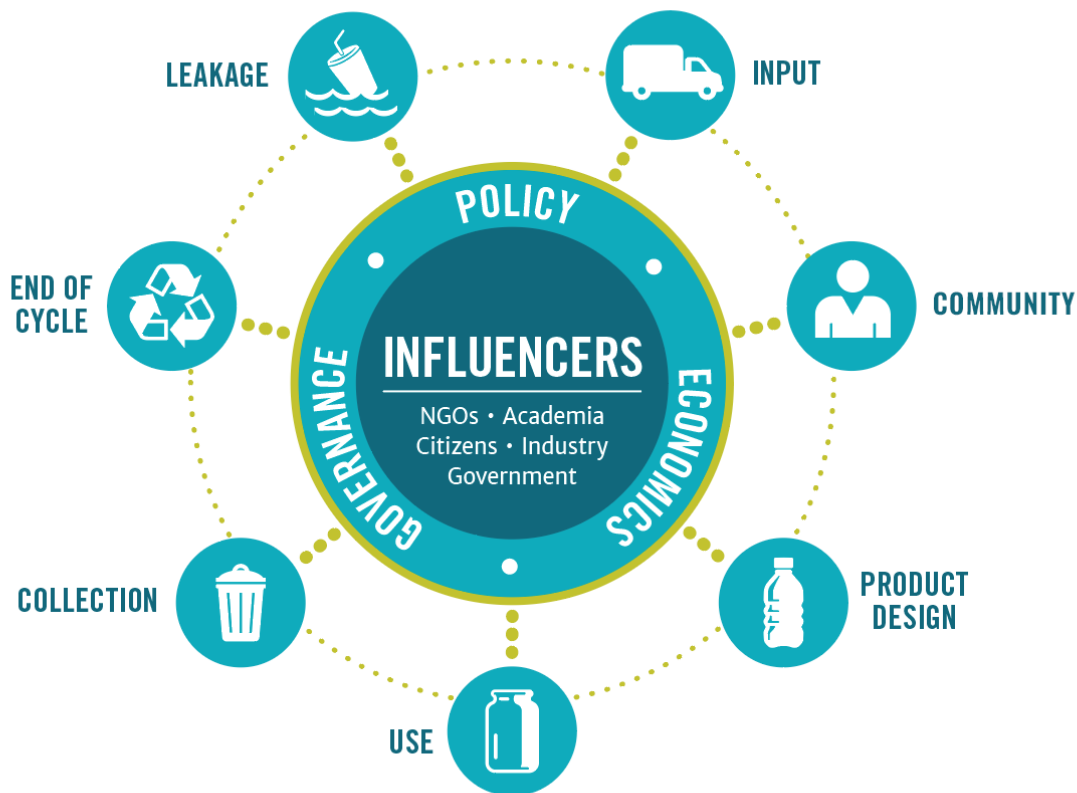
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## Executive Summary

Developed by the Circularity Informatics Lab at the University of Georgia, the Circularity Assessment Protocol (CAP) is a standardized assessment protocol to inform decision-makers through collecting community-level data on plastic usage. Grounded in materials flow and systems thinking concepts, the CAP uses a hub-and-spoke model to holistically characterize how consumer plastic flows into a community, is consumed, and flows out, either through waste management systems or leakage into the environment. The model, shown below, is comprised of seven spokes: input, community, material and product design, use, collection, end of cycle, and leakage. At the center, the system is driven by policy, economics and governance with key influencers including non-governmental organizations, industry, and government.



Between October 2020 and March 2021, a team from Centro de Estudios y Acción Social Panameño (CEASPA), with guidance and support from the Circularity Informatics Lab, conducted fieldwork in the city of Panama City, Panama. The CAP was conducted with support from the city's local government, Resilience Officers, and the larger Urban Ocean team. Field work included product and packaging assessments in stores across the city; key stakeholder in-

interviews with government, industry, and non-profit organizations; material type characterizations for consumer plastic items; cost analysis of reusable products and alternatives to plastic available in the city; visual audits of recycling contamination; identification of public waste and recycling collection bins; and litter transects in three categories of population. Key findings from each spoke are summarized in the table below.

## Urban Ocean Program

Urban Ocean is a three-way cooperative partnership among The Circulate Initiative (TCI), Ocean Conservancy (OC), and Resilient Cities Network (R-Cities) that works with city leaders to bring new ideas, partners, and resources together to solve interrelated problems around waste management. It aims to demonstrate how actions to improve waste management and recycling can provide holistic, resilient, and sustainable solutions that not only reduce ocean plastic pollution but also address key city priorities such as improving public health, promoting innovation, supporting economic development and job growth, and reducing greenhouse gas emissions through a capacity building and accelerator program for cities.

Panama City is one of the cities in the initial cohort of Urban Ocean learning cities. The CAP in Panama City, coupled with the upcoming Opportunity Assessment Tool, represents Stage 2 of the Urban Ocean Initiative which involves a comprehensive Gap Assessment to map challenges, risks, and vulnerabilities within the cities' critical waste management systems. The data gathered from the CAP in Panama City will contribute to three workshops where stakeholders will discuss findings and develop proposal(s) for interventions that will then be brought to an Accelerator Summit for review and support, as shown by the timeline of the program below:



## Get to know the partners:

**Ocean Conservancy** is working to protect the ocean from today’s greatest global challenges. Together with our partners, we create science-based solutions for a healthy ocean and the wildlife and communities that depend on it. Since the formation of the International Coastal Cleanup in 1986, Ocean Conservancy has mobilized millions of volunteers to remove trash from beaches and waterways around the world while pioneering upstream solutions to the growing ocean plastics crisis. Ocean Conservancy invests in cutting-edge scientific research, implements on-the-ground projects, and works with conservationists, scientists, governments, the private sector, and members of the public to change the plastics paradigm. To learn more about our Trash Free Seas® program visit [oceanconservancy.org/trashfreeseas](https://oceanconservancy.org/trashfreeseas), and follow Ocean Conservancy on [Facebook](#), [Twitter](#) and [Instagram](#).

**The Circulate Initiative** is a non-profit organization committed to solving the ocean plastic pollution challenge by supporting the incubation of circular, inclusive, and investible waste management and recycling systems in South and Southeast Asia. We achieve this by collaborating with key stakeholders across the sector, and by producing insights to support and accelerate investment and scale across the value chain.

**The Resilient Cities Network** consists of member cities and Chief Resilience Officers from the former 100 Resilient Cities—pioneered by The Rockefeller Foundation program, sharing a common lens for holistic urban resilience. The Resilient Cities Network in partnership with its global community continues to deliver urban resilience through knowledge sharing, collaboration, and creative action, seeking to inspire, foster, and build holistic urban resilience around the world.

## Key Findings and Opportunities

### INPUT



**Findings:** 15% and 23% of top convenience products sampled had parent companies and manufacturers located within Panama City. This includes 90% and 70% of top yogurt and popsicle product manufacturers and parent companies, respectively.

### Opportunities

- Partnerships with local manufacturers and parent companies can explore packaging design and waste management for problematic items to reduce waste leakage and litter.



**COMMUNITY**

**Findings:** Interviewees reported that age, income, and education are drivers in the differing levels of awareness around plastic pollution, as well as the ability and willingness to make changes. Reportedly, existing policies are not consistently enforced and several interviewees doubt they drive real change.

**Opportunities**

- Enforce policies consistently across the city and revisit data collection methods from the CAP over time to determine efficacy of recent policies on single-use plastic and use data to increase public awareness.
- Improve communication about collection schedules to minimize uncontrolled trash at pick-up points and reduce leakage into storm drains and waterways.

**PRODUCT DESIGN**

**Findings:** 68% of top grocery and convenience products (including 98% of snack products) were packaged in some form of plastic film (one of the most abundant litter items found in Panama City). 43% of to-go items from restaurants and food vendors were polypropylene, 40% were expanded polystyrene foam (EPS), and only 1% was the more readily recyclable polyethylene terephthalate (PET).

**Opportunities**

- Work with local stores (also manufacturers and companies) to rethink delivery of problematic plastic film products and discuss implementation of extended producer responsibility (EPR).
- EPS is a material that could feasibly be phased out of the city. CAP data may be useful for implementation of Law 187

**USE**

**Findings:** Plastic alternatives, particularly paper and compostable plastic, are becoming more common in local businesses and restaurants, with the material representing 11% of the bags sampled. Refill and reuse schemes are not popular in the city and there is a strong tendency towards disposable items because of their cost and convenience. Paper alternatives for to-go items are at a much higher price point for local business owners to supply to customers and are mostly offered in the form of paper cups.

**Opportunities**

- Reduce waste by exploring refill or reuse options available for household goods or popular grocery goods.

**COLLECTION**

**Findings:** General household waste collection is largely handled by local government and reaches around 87% of residents, though it can be irregular and confusing to some residents. Collection of recyclable items is primarily through the informal sector.

**Opportunities**

- Expand door to door collection of waste to reach a higher percentage of residents.
- Residents show a willingness to bring trash/recycling to a designated location for aggregation, so this is an opportunity for both source segregation and management of items that are not readily recyclable or compostable.
- The availability of public waste bins and recycling bins should reflect the population count and business activity within an area, some parts of Panama City may consider increasing the number of bins that currently exist (especially recycling).

**END OF CYCLE**

**Findings:** The local landfill has had a series of environmental and safety concerns (including a landslide in June 2021) and is reaching its capacity several years before it was originally due to close. The informal sector manages the recycling with the market highest for metal items, while plastic items do not yield high returns. Compostable plastic single use items are used by vendors, but no industrial composting is available.

**Opportunities**

- The Cerro Patacón landfill is an emergency and needs immediate attention. Necessary improvements should be installed to provide safe and secure operation and protection of human health and the environment. In addition, closing the facility earlier than intended and/or developing a new sanitary landfill that can service the area more effectively should be explored.
- Steps could be taken to formalize the recycling industry and/or provide the sector with safer working conditions and reliable product values to create a more profitable livelihood and stable market.
- Conduct a feasibility study for installing an industrial composter to collect the compostable plastic items that are being used at local businesses, as well as the organic matter (food waste, etc.). This should be coupled with public awareness around how to properly dispose of such items.

**Findings:** Food plastic (such as packaging) and plastic fragments were the most abundant materials among the litter documented in Panama City. Litter density overall (1.43 – 3.04 items/m<sup>2</sup>) was higher than average compared to regional and global estimates. Common plastic items such as food plastic, plastic fragments, other plastic, PPE, and personal care items comprised 58% of the total litter items documented.

## LEAKAGE



## Opportunities

- Explore targeted policies that are enforced and are accompanied with public awareness campaigns on alternatives, proper waste disposal, and the potential environmental damage of littered items.
- If Law 198 proves successful, it would be useful to integrate some of the most problematic items into a scaled or expanded version of that policy.
- Extended Producer Responsibility (EPR) initiatives could target the most frequent and abundant items that end up in the environment (leaked).
- If there is a desire to measure impact from interventions targeting opportunities to reduce plastic leakage, conducting transects over time and at later periods in time is recommended.

## Strengths

- At least one parent company and one manufacturer for each of the top brands of all 6 convenience items (minus tobacco) are located within Panama City itself, which provides many opportunities for circularity discussions and potential action at the local level, and further discussions of Extended Producer Responsibility<sup>1</sup> (EPR)
- There are national-level policies and bans in place that focus on key issues and problematic single-use items, though their enforcement varies
- Recent steps have been taken in the city to increase household collection and public perception seems to be improving after those changes were made
- There seems to be willingness for source segregation and there may be opportunities to promote that through public campaigns
- Alternative materials such as paper and compostable plastic are becoming more popular in local businesses, food vendors, and restaurants, though they are often still more expensive for business owners to provide
- Local groups such as public-private partnerships and churches have provided programs that offer recycling services at no cost and encourage awareness around plastic pollution and how to properly handle waste
- Much of the household waste in Panama City is organic, and there are strong recycling markets that exist for some items (particularly metal), though not for plastic currently

1. Extended Producer Responsibility (EPR) is a Policy approach whereby producers (e.g., raw material manufacturers, converters, packers or fillers, and brands) take a significant financial and/or physical responsibility for the end-of-life management of post-consumer products (Plastics Policy Playbook, Ocean Conservancy, 2019)

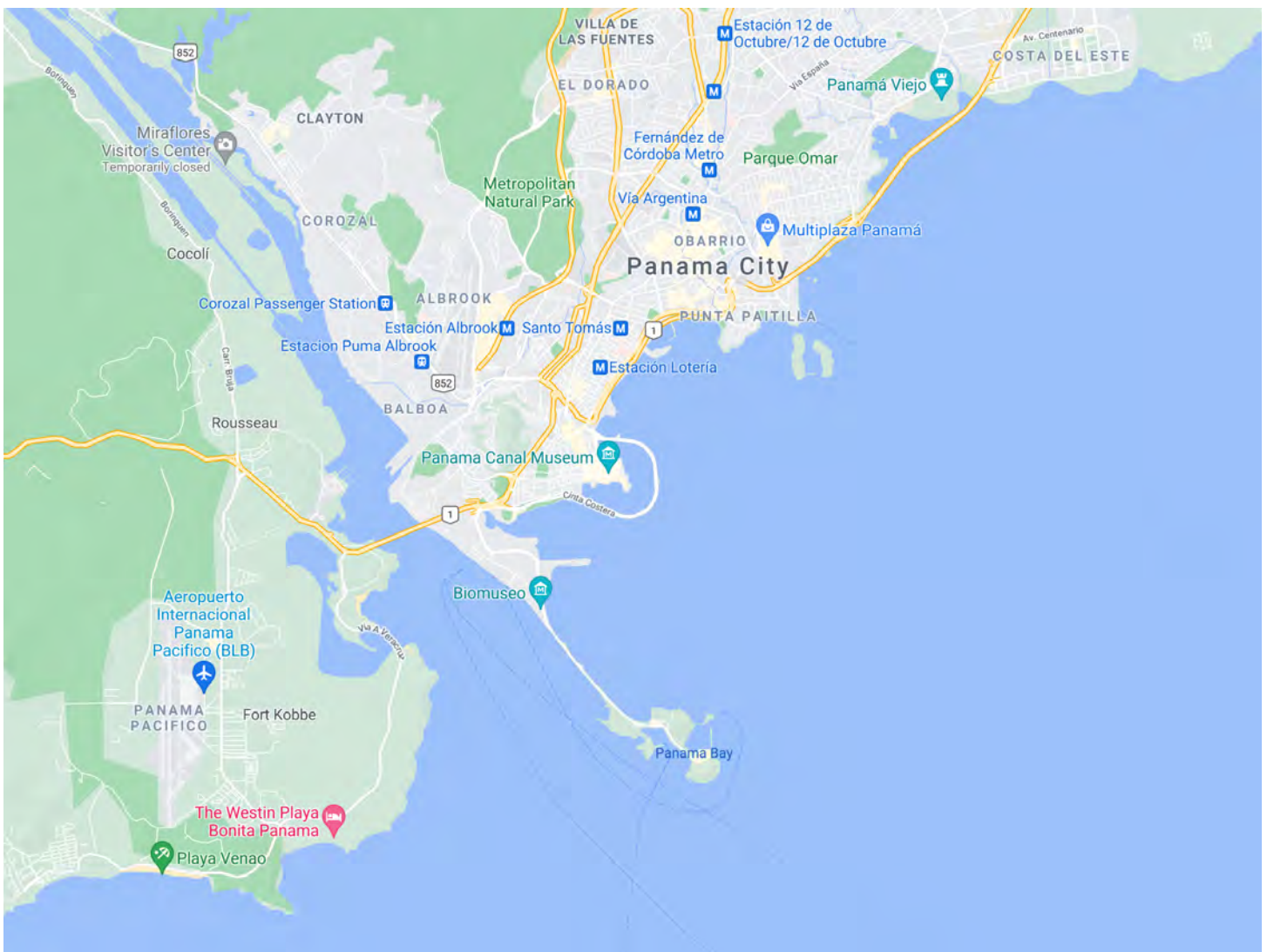
# Glossary of Acronyms and Abbreviations

**CAP** – Circularity Assessment Protocol  
**CE** – Circular Economy  
**CEASPA** – Centro de Estudios y Acción Social Panameño  
**CIL** – Circularity Informatics Lab  
**C&D** – Construction and Demolition Material  
**EPR** – Extended Producer Responsibility  
**EPS** – Expanded Polystyrene  
**HDPE** – High Density Polyethylene  
**GDP** – Gross Domestic Product  
**IWC** – Independent Waste Collector  
**LIP** – Local Implementing Partner  
**MPs** – Microplastics  
**MSW** – Municipal Solid Waste  
**MSWM** – Municipal Solid Waste Management  
**NMI** – New Materials Institute  
**OC** – Ocean Conservancy  
**PE** – Polyethylene  
**PET** – Polyethylene terephthalate  
**PP** – Polypropylene  
**PPE** – Personal Protective Equipment  
**PS** – Polystyrene  
**RCities** – Resilient Cities Network  
**SWM** – Solid Waste Management  
**TCI** – The Circulate Initiative  
**UGA** – University of Georgia



## Introduction

Panama City is the capital of Panama and the country's largest city, located on the Pacific Coast with an estimated population of nearly 1.9 million in the metropolitan area. The population has been increasing at a rate of 2.09% per year since 2015 and is projected to continue to grow. The predominant economic drivers in Panama City are commerce, banking, and tourism, and the city itself is responsible for over half of the country's GDP (WPR 2021).



Panama City, Panama

The per capita waste generation rate for the country of Panama is estimated to be around 1.2 kg/day (Alcaldía de Panamá 2018). Studies from the Cerro Patacón Landfill, which services Panamá and San Miguelito Districts, estimate that the per capita waste generation for the city is similar to the country's average at around 1.25 kg/day (INECO 2017). Slightly less than 60% of the population of the country of Panama has access to controlled municipal solid waste disposal services, and this was mirrored in a study for the metropolitan area of Panama City in 2015 where 59% of residents surveyed reported that they had regular waste collection in their community and 3% reported that they had no access to waste collection (Hettiarachchi et al. 2018; IDB 2015).

Panama City has nine rivers that run through it to feed into the Pacific Ocean and directly into the Panama Canal. This makes it a critical city to Panama not only from an economic perspective, but also from an environmental perspective. With a growing urban population, the city has faced challenges related to waste management in recent years and there is a need to upgrade processes and infrastructure to handle a growing population, residents' needs, and the associated increasing amount of household waste. Panama City is also in a relatively unique position in that the municipal SWM system is largely controlled at the national level.

As one of the cities in the initial Urban Ocean cohort, Panama City set out to characterize and understand its materials flow and waste management systems and identify associated opportunities for collaborative solutions. As a first step in the Urban Ocean process, UGA partnered with a local implementing partner (LIP) in Panama City—Centro de Estudios y Acción Social Panameño (CEASPA)—to conduct CAP in the city.

The Circularity Informatics Lab at the University of Georgia has developed a Circularity Assessment Protocol (CAP), which is a standardized assessment protocol used to collect community-level data to inform decision-makers. The CAP characterizes seven community components:

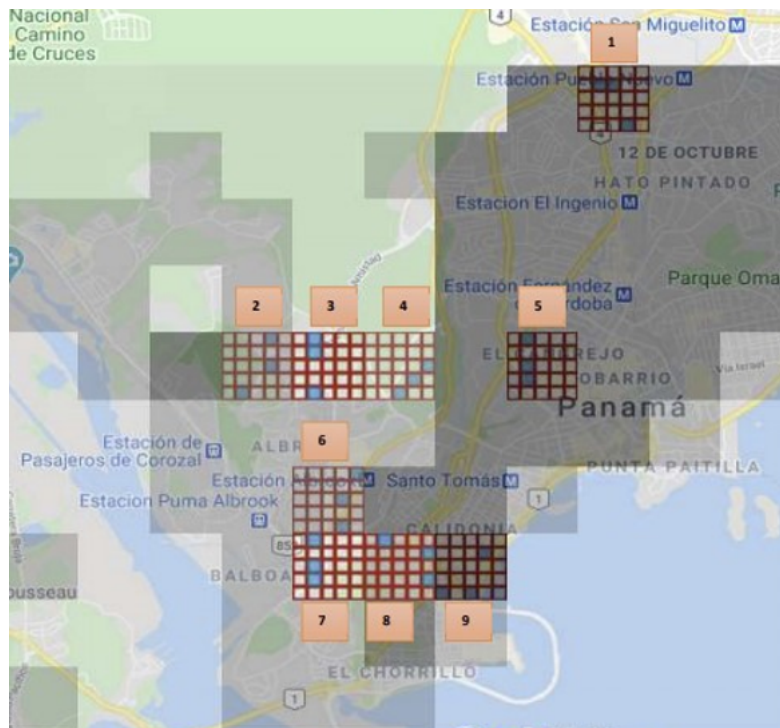
1. **Inputs**—What products are sold in the community and where do they originate?
2. **Community**—What conversations are happening and what are the stakeholders' attitudes and perceptions?
3. **Product design**—What materials, formats, and innovations are found in products, particularly packaging?
4. **Use**—What are the community trends around use and reuse of product types?
5. **Collection**—How much and what types of waste are generated? How much is collected and what infrastructure exists?
6. **End-of-cycle**—How is waste disposed? What is the fate of waste once it is properly discarded? How is it treated?
7. **Leakage**—What waste ends up in the environment? How and why is it getting there?

Various influencing factors drive this system including governance, economics, policy, and legislation (e.g., bans, taxes). Furthermore, multiple stakeholders exist at every level of the CAP influencing the complex system, and these include the public, government, industry, NGOs, consumers, and academia. While the hub and spoke model illustrates the CAP, it is a complex system with components inherently interconnected to each other and life cycle impacts beyond each spoke. The CAP is a framework approach to the flow of materials, in this case focusing on plastic and packaging, and the quantity and characterization of leakage from this sector will be characterized during litter assessments that can inform upstream interventions in the rest of the systems model. As of early 2021, CAP has been conducted in 26 cities in ten countries.

This report documents work conducted by the Circularity Informatics Lab at the University of Georgia (UGA) and

CEASPA as part of Urban Ocean. Background information and a literature review were conducted in September 2020. Fieldwork was conducted from October 2020 – March 2021. The CAP report is split into the following sections, which include results and discussion of each: Input, Community, Product Design, Use, Collection, End of Cycle, and Leakage, followed by Opportunities to support the forthcoming Opportunity Assessment Tool Workshops for Urban Ocean cohort cities.

**Figure 1:** Map of the 10x10km sample area within Panama City.



Population counts are shaded in gray. The 1km<sup>2</sup> sample areas for product data are shown in red and 200m<sup>2</sup> areas for litter transects are shown in blue.

# CAP Results

## Input

To get a snapshot of the characterization, scope, and source of common plastic packaged items that are entering Panama City, common convenience items were sampled within nine 1km<sup>2</sup> transects in Panama City—three within each tertile of the population count. The LIP selected three convenience or grocery shops to sample within each 1km<sup>2</sup> transect area.

For each of the top products documented, the LIP noted the type of packaging (including polymer, if possible), the brand, and the parent company. From there, the team was able to determine the manufacturing location, which was determined from manufacturing locations listed on product packaging or desktop research, as well as the headquarters location for the parent company of the brand (largely determined by desktop research).

**Table 1: Most Popular Plastic Product Distances to Parent Company Headquarters and Manufacturing Facilities**

	Distance Store to Parent Company (km)				Distance Store to Manufacturer (km)			
	Minimum	Maximum	Average	Median	Minimum	Maximum	Average	Median
Beverages	0	10,413	4,518	3,998	0	7,518	1,813	514
Candy	0	10,873	4,553	4,811	0	10,536	3,366	2,778
Chips	0	5,396	3,428	5,028	0	4,456	2,345	1,509
Other Snacks	0	5,404	2,272	600	0	3,921	1,097	537
Popsicles	0	539	32	0	0	539	32	0
Tobacco Products	4,487	10,063	7,321	10,063	1,398	9,408	2,941	3,326
Yogurt	0	1,510	403	0	0	0	0	0

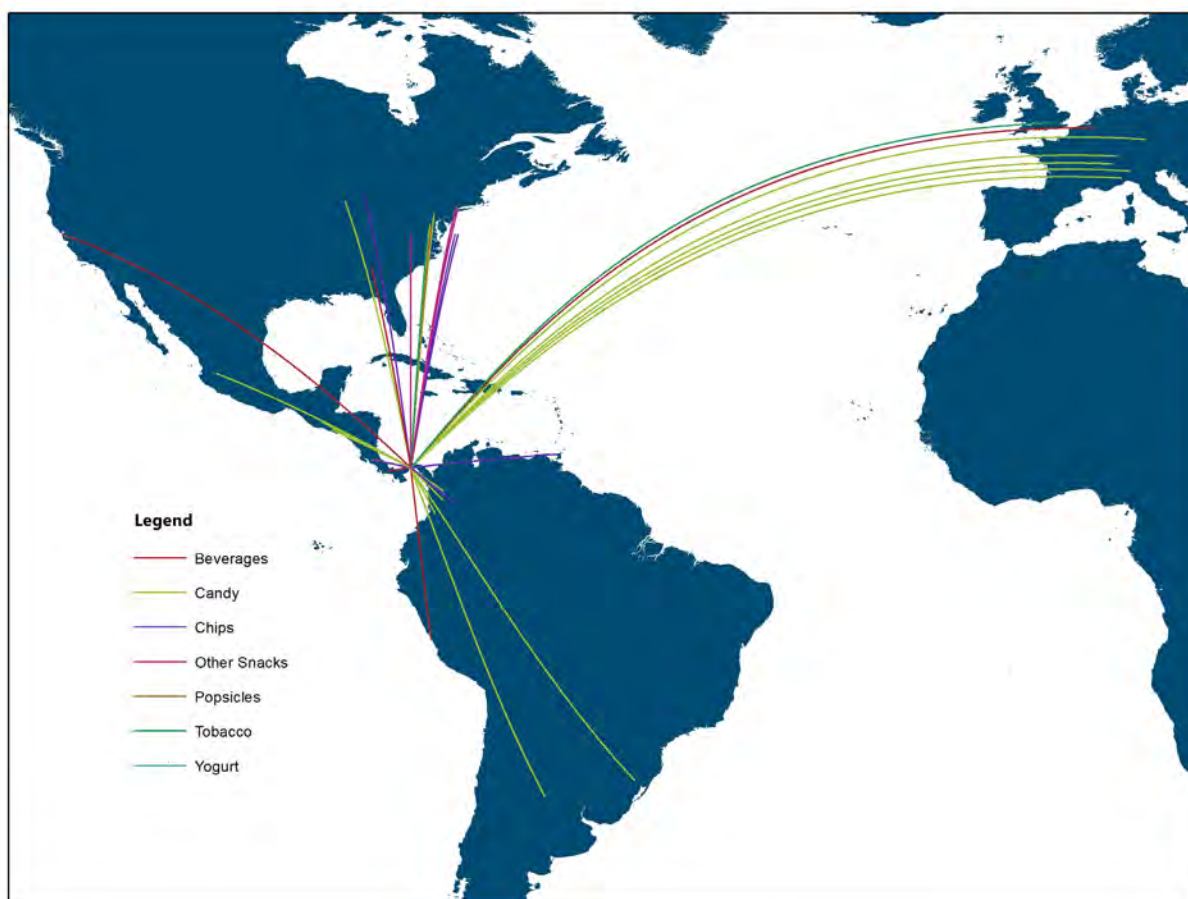


"Zero" values for distances occurred when manufacturing facilities and headquarters were located in Panama City. Store, manufacturing facilities, and headquarters were all generalized to the center point of the city where located. Products that did not contain plastic were removed for the distance analyses.

Tobacco products on average had parent companies and manufacturers in locations that were farthest from Panama City, followed by candy and beverage products. In contrast, all of the parent companies and manufacturers of popsicle products were within 540km of Panama City and all of the manufacturers for yogurt products were within Panama City itself. It is worth noting that all the product categories except for Tobacco had at least one parent company and manufacturing location within Panama City.

Among the top brands sampled, all the yogurt product manufacturers, 94% of popsicle product manufacturers, 50% of beverage product manufacturers, 44% of other snack product manufacturers, 8% of candy product manufacturers, and 2% of chip product manufacturers were located within Panama City. Similarly, 95% of popsicle product parent companies, 73% of yogurt product parent companies, and 40% of other snack product parent companies were located within Panama City. Six percent or less of the parent companies for candy, beverage, and chip products and none of the tobacco product parent companies were located in Panama City. Among all products, this translated to a total of 23% of product with manufacturers and 15% of products with parent companies that were located in the city itself.

**Figure 2: Location of Parent Companies of Common Brands of Convenience Products in Panama City**



**Figure 3: Location of Manufacturers of Common Brands of Convenience Products in Panama City**

Among all of the convenience product companies that were documented for top products, 22% of all manufacturers and 17% of all parent companies were based within Panama. Based on the individual product and product type data, it seems that the most popular products to consumers are those that have more domestic presence with their parent companies and manufacturers, which could allow for increased circularity within Panama City.

## Community

To understand current attitudes and perceptions of plastic waste, semi-structured interviews were conducted by CEASPA with 29 key stakeholders (Table 2). Among those interviewed, five were informal recycling aggregators, four were food vendors, four were from academia, four were private waste hauling, landfill, or recycling companies, four were NGOs, three were from local government, two were from the Plastics industry, two were convenience store staff, and one was a company using or producing plastic alternatives.

Table 2: List of Stakeholders Interviewed for CAP

Stakeholder Group	Number of Interviews
Informal Recycling Aggregator	5
Food Vendors	4
Academia	4
Private Waste Hauling, Landfill, or Recycling Companies	4
Local NGOs	4
Local Government	3
Plastic Industry	2
Convenience Store Staff	2
Companies Using Plastic Alternatives	1

Among those interviewed, there was a general agreement that plastic pollution is an issue that needs to be addressed in Panama City. Issues related to plastic pollution were readily identified by participants, including links to storm drain clogging, flooding, and disease. However, it became clear through the interviews that there are differences in the level of awareness as well as the willingness and ability to make changes to reduce single-use plastic and plastic waste reported by interviewees based on age, income, and education gaps.

**“The National Authority Aseo doesn't have the capacity to pick the trash every day, and so the garbage ends up in the ocean. The rain takes all the trash to the rivers and ocean. It is a problem. It is a problem for flooding of drains, sewers.”**

— NGO

**“[Awareness is] low. Very low. Maybe kids, younger generations have more awareness, and in the area of Pueblo Nuevo, for low income people, their priority is to work day by day. And really, if they are living surrounded by garbage, their final priority is still to bring bread to the table every day, and they aren't paying attention to plastic contamination... but it's**

important that you get rid of this plastic contamination because it brings other problems, like dengue, or other problems to your home. Overall there isn't consciousness about it."

— NGO

"I think the community is divided into different types of consciousness and ages. I think there is a quite conscious generation, but at least in my community there are many older people who have had a difficult time understanding the problem of plastic, obviously because they come from a generation where plastic was not a problem. If I had to put a % of the people who are concerned in my community about plastic pollution it would be 10% at most. I think that, for the sector, which is still quite privileged and educated, environmental awareness has not arrived as it should."

— NGO

"I can't come up with a solution for West Panama, Chilibre or Arraiján, if I don't go inside the community and find out what the problem is because all of the communities are different from one another. It's hard to believe, but we're next to each other, and each one has a different perception of the problem."

— Government Official

Several interviewees mentioned that churches and religious groups seem to be a motivating factor for bringing people together on this issue, inspiring action, and communicating key messages to the community. One particular event was noted several times, where a local Church provided recycling services and outreach to its community.

"What we do is that the Church designates a Sunday of each month, as an incentive to the surrounding communities to recycle and people of the communities take it to the Church, and we bring the trucks of the cooperative to start the separation."

— Informal Recycling Aggregator

Among the interviewees, particularly the recycling companies, there seemed to be a general agreement that the majority of the waste in Panama City is organic food waste, which ends up being collected and transported to the local landfill.

"The majority of waste the community deposits is organic."

— Informal Recycling Aggregator

"It is a combination of food waste and green area maintenance residue."

— Private Recycling Company



**“At the moment [we capture] about 20 tons per month [of organics], sometimes more or less.”**

**— Private Recycling Company**

It was noted several times in the interview process that, despite the fact that the majority of household waste is collected and managed by the state, the collection process is still inconsistent and also does not exist uniformly for recycling.

**“In my community garbage is collected by the state, through the Waste Authority, it has a system that comes at least three days a week, there is no segmented collection, that is, everything that is collected goes to the garbage. That would be the general service, it does not have a stipulated time, it can happen at 7 in the morning, or at 2 in the afternoon or at dawn. In other words, it depends on them and how they have organized the route.”**

**— Private Recycling Company**

Based on interviews, it seems that there is a general sentiment that household waste collection has improved recently as a result of pressure from the community and is largely available in the urban areas. Other than one government official who had an example of a community not wanting garbage trucks to collect waste, it was repeated several times in the interview process that people protesting directly led to increased household waste collection, but that the issue now lies with the waste management infrastructure following collection, such as the Cerro Patacón landfill. The landfill itself faces significant challenges, including health and safety concerns and increased waste input beyond its capacity. It was expressed that there is a general lack of transportation vehicles, sorting space, compactor technology, and other key infrastructure for waste management in Panama City. And based upon interviews, it appears the collection coverage and process remain a complex issue because it has so many moving components and varying stakeholders.

**“The reality is that when people get their garbage collected, people stop protesting. It is out of their face and the problem is over. So while that is controlled, people are not going to complain, and they say that everything is fine. I think that the collection part has improved a lot, for me at least in my community. Then it makes me say that everything is fine.”**

**— Private Recycling Company**

**“Exactly, [collection] has been controlled, if we go to the east side, where there were a lot of patacones (miniature dumps) stuck on the street, those have been disappearing and you already realize that people there have stopped protesting and even in some places they have put nice things where there used to be garbage. That is, on the one hand, the garbage service has been improved, but the problem of Cerro Patacón [local landfill] is growing, that is a time bomb.”**

**— Private Recycling Company**

**“We have three vehicles and a trailer. We have a small vehicle with a capacity of 300 kilos for residential use, a 2.5-ton open truck for commercial use. We have a little used little three ton waste compactor truck and trailer.”**

**— Private Recycling Company**

**“I feel that we have not gone to the root of the waste problem, there is no treatment plant, the recycling industry is a collection center, I think it is also tedious for the recycling system because it is something that in the end is not something that works for someone who wants to start a business.”**

**— NGO**

Although often a controversial choice, establishing a waste-to-energy plant was suggested by some government officials as one way to address the problem of Cerro Patacón.

**“I think it would be very feasible to set up a waste-to-energy plant in Panama, which won’t only deal with all of the solid wastes but also generate one, two, three, or four environmental benefits. It will give the country's economy a major boost because it would generate jobs, clean water, and energy, which is so important, and we need it now. You could collect all kinds of wastes, not just one in particular.”**

**— Government official**

Recycling is largely informal in Panama City and there is not an organized system for household collection, transportation, or aggregation. The private informal sector mostly consists of locals who collect and sort recyclables from Cerro Patacón landfill to resell to private companies (INECO 2017). According to CAP stakeholder interviews as well as external interviews that have been conducted in Panama City in the past, locals who do this work say it is very difficult and unpleasant, and that they struggle to survive and make a sustainable income to support their families (Agencia EFE 2018). Some interviewees expressed that the current systems and infrastructure for waste management and recycling in Panama City do not optimize waste collection and management, nor do they incentivize sustainable livelihoods associated with those sectors.

**“No, [there is] very little [recycling in the community], the people who walk the streets who are called “the knights of the night”, destitute, they go through the trash tanks and take out what is metal and sell it, transport it to where they buy and sell, recycle and sell it.”**

**— Informal Recycling Aggregator**

**“So they see recycling as a momentary thing, I sell here, I buy a pair of tennis shoes and I get out of this. We, my brother and my dad do not see it that way,**

we see it as a business that goes on, goes on and on and does not stop, you have your downs like anyone else, you fall down and try to get up.”

— Informal Recycling Aggregator

“As you can see, there’s not much space here... I could buy more, but I don’t have the right place or the right technology. I’d need a forklift or a digital scale to be able to buy and handle more material.”

— Informal Recycling Aggregator

Interviews also shed light on the dynamics of the informal recycling sector and suggested that it is a very close-knit community, and that it has specific silos or remits depending on the material that is collected. Some also noted that the informal sector can be wary of large corporations, technologies, or changes that might disrupt the network and processes of the informal sector and the way that the ‘status quo’ has been done in some cases for generations. There were also mixed sentiments on whether they should be formalized and organized, though several interviewees did note that their working conditions and safety need to be improved.

“[The material] is classified only in the jumbo and they compact it. And to compact it as they wanted, they came and spoke here that they wanted to put a warehouse and machinery for us, we didn’t want that, we take the material to them, you weigh it and that’s it. We didn’t want to be involved with them on that level.”

— Informal Recycling Aggregator

“We are the metal group, so before we were the ones who bought frequently, I would go up during the day and my father at night and my brother also always one of us buying. Now that others have joined in buying material, they are being given the opportunity to buy and now another group has been created. At least I am going up three days a week, Monday, Wednesday and Friday and my dad is also going up at night, my brother goes up Tuesday, Thursday and Saturday. And we take turns, then one goes up at night every other day, each one goes up like three times a week.”

— Informal Recycling Aggregator

“Definitely they have to be included not only to give them opportunities but because it is a help, but they must be trained and give them the labor rights that they deserve so that it is not something informal, therefore, it must be something more structured so that it is not only safe for them but safe for the system itself.”

— NGO

**“Legislation has to promote separation at the source and not sending mixed, contaminated material for people there to work in inadequate conditions to rescue that contaminated material.”**

**— Private Recycler**

While household recycling is largely informal and inconsistently available, there are larger recycling aggregators that collect materials from businesses generating larger amounts of waste, as well as from the smaller informal aggregators. While these haulers do collect materials like plastic and coated paperboard containers, they primarily focus on more valuable recyclables with upstream buyers in Panama, which tends to be paper products. In contrast, international plastic markets tend to fluctuate, affecting not only profits for private recyclers but also income for informal collectors. Some interviewees suggested this cost of recycling plastic might be offset by producers.

**“We have a fleet that mainly collects from those who generate over a ton of waste. They are primarily companies that create that type of volume. A good amount arrives directly at our door; we are in an accessible place. Those wanting to sell recyclable materials go there. They can sell from one kilo to tons. The highest percentage of what we collect every month is collected by our fleet directly from the generators.”**

**— Private Recycler**

**“The problem with plastic is that plastic moves. The international plastic prices move with the price of oil... plastic was always a challenge because plastic is a material with a lot of volume and little weight. That explains why most of the plastic generated in the country ends up in rivers and seas... It is a big challenge. It has always been a big challenge because if you fill an eight-ton truck with plastic, the effective weight of the material does not reach one ton... You don't make enough to pay for the freight... The big challenge is that somehow, this operation should be supported by the generators.”**

**— Private Recycler**

Generators of plastic expressed the challenges of practically implanting an extended producer responsibility program.

**“There was a lot of talk about the concept of shared responsibility, which states that the manufacturer must collect all the waste it produces... it is really crazy for us to go to Cerro Patacón, or wherever, to look for our packages. It's virtually impossible. And the material would come back contaminated; it is not really possible. We definitely have all the willingness to facilitate, dispose and, in the future, maybe even expand our recycling area a bit more. Perhaps, to be able to accept post-consumer waste. But to get there, we need help from the government or other institutions.”**

**— Plastic Packaging Manufacturer**

On the consumption end, several interviewees expressed that recycling by consumers in Panama City seems to be largely motivated by the prospect of getting something in return or receiving some sort of benefit for the action. The market for recyclables in Panama City is mostly in more valuable materials like metals, and plastic does not generate as much of an income for informal recyclers, nor is there much opportunity for deposit or return schemes for plastic products that consumers can benefit from.

**“In my community there is no formal recycling. Everyone starts separating, for example you start collecting tetra pak, you have to see where to take it, in the area of the metal recyclers the people take it, obviously certain materials generate more income so it is easier for people to take it to them, aluminum especially because they pay more. For example with plastic, since you can earn very little from it, in the periphery of Pueblo Nuevo, the township where I am located, nothing else is recycled except for aluminum or other metals, more than anything those materials are recycled. The subject of recycling is not significant. Yes we’ve had joint initiatives, last year for the JMJ [Recycling Company], the Religious centres had recycling stations but it didn't last.”**

— NGO

Policies that do exist related to single-use plastic and waste management in Panama City do not appear to be fully enforced and interviewees expressed that there is not much faith in those policies among the public. People and businesses tend to find a workaround that works best for them and there are no repercussions. Several interviewees suggested that if people are making genuine changes to their lifestyle or their business, it is because they really want to for their personal values or their image, as no incentives currently exist and plastic alternatives are typically cheaper and easier to acquire. Interviewees also referenced inconsistencies with policies and government stances on these topics, which were frustrating to the public.

**“There is no policy in Panamá. With the law that banned plastic bags, retail commerce requires customers to bring your bags. And if you don't bring your bag, you buy your bag. For small grocery stores, what is the policy of packaging? Basically you either take your own reusable bags, if not you see what can be used so you can take your merchandise. It is not a policy. More than a ban, we could do more. There’s an interesting fact...that local supermarket, Riba Smith, they have changed the packaging of their fruits and vegetables from Foam to carton, they are still covered by a plastic paper, people would like for it to disappear, there’s no technology yet to replace that but they have chosen to do it as part of their responsibility, their image as a corporation, but there is no law or policy that requires them to do it. There's no incentive for them.”**

— NGO

**“Definitely the public policies on packaging I know that have been approved, but I do not see that they are applying them, nor are they monitoring it. If we go to the Plastic Bag Law, they stopped controlling it a long time ago, for me plastic bags have already re-entered**

**the market and there is no one who is avoiding them. So I think that they are definitely not complying with any of the public policies that they have applied for packaging.”**

**— NGO**

**“I think that the policies are very tight, to pay to have permits, which is fine, but it cannot be categorized as if everything was dangerous, and that everything produces severe contamination... in the end it is very complicated. The ministries that reward you one day are punishing you the next.”**

**— Private Recycling Company**

**“Now, with all the deliveries [because of the COVID-19 pandemic], it has been necessary to buy more disposable supplies. About six or eight months ago, we changed everything to biodegradable. Even the packages we use are made of paper; some take longer to degrade because they are made of tapioca with something else, I think. Since there is a law, we have prepared ourselves in all our businesses to comply with it. Furthermore, perhaps six months ago, there was a very good campaign to promote the image of those who took care of the environment. We began to change.”**

**— Restaurant**

One potential exception to the trend around public perception to plastic-related policy could come with Law 187, enacted in December 2020. This law identifies eleven single-use plastic items for the country of Panama to progressively phase out and replace by 2023 (Patrick, K. 2021). This could present an opportunity for the City to revisit the CAP, or portions of the CAP, in or after 2023 to determine whether the policy is being implemented effectively and identify any gaps that need to be addressed.

As is noted in the Use section of this report, several grocery and convenience stores in Panama City do provide compostable bags as an alternative to standard PE or PP plastic bags, but some of the interviewees expressed concerns that they were not being disposed of properly. It was suggested that consumers may be confused about what compostable or biodegradable mean and how to dispose of those items properly, and that the compostable bags were contaminating waste that would otherwise be properly managed and processed.

**“I see it from my point of view that I have organic at work, I know that there are some bags that do not comply, because we tell our users to deposit in compost bags and there were bags that said they were compostable but are not, and that are not oxo-biodegradable either.”**

**— Private Recycling Company**

As with many other cities, the high cost of alternatives when compared to standard plastic products was often cited as a major barrier to both consumers and businesses making the change.



“People will accept it as long as they can afford it. Alternatives are being promoted on social media, and the price can be a mitigating factor. It is a mitigating factor because people are open-minded in that they want to use the alternatives. I want to use it 100%, but I can pay for it very little.”

— Private Recycling Company

“I have heard of companies that are offering [alternatives], in the community not so much, but they are being promoted by the networks, biodegradable packaging of paper or sugarcane bags. There are alternatives that have started to come out. I think they are still struggling with the cost and price part, but alternatives are already starting to emerge.”

— Private Recycling Company

From the stakeholder interviews we gain a better understanding of some of the current challenges and barriers around plastic consumption, use, and disposal in Panama City. It is clear that solutions that are developed in the future should be communicated in a way that reaches more demographics, enforced, cost-effective, and associated with incentives that make them approachable and manageable for consumers and businesses alike.

### Product Design

To characterize material types used in common consumer plastics, samples of common convenience and to-go items were obtained as described in the Input section. The LIP collected samples from stores and restaurants when they were located in each of the nine 1km<sup>2</sup> transect areas where possible (two of the transect areas had no restaurants or food vendors and two had no grocery or convenience stores, as they were residential or public park areas). The average weight of both the packaging and the product itself were collected for all of the 428 samples of top items from 32 grocery and convenience stores.

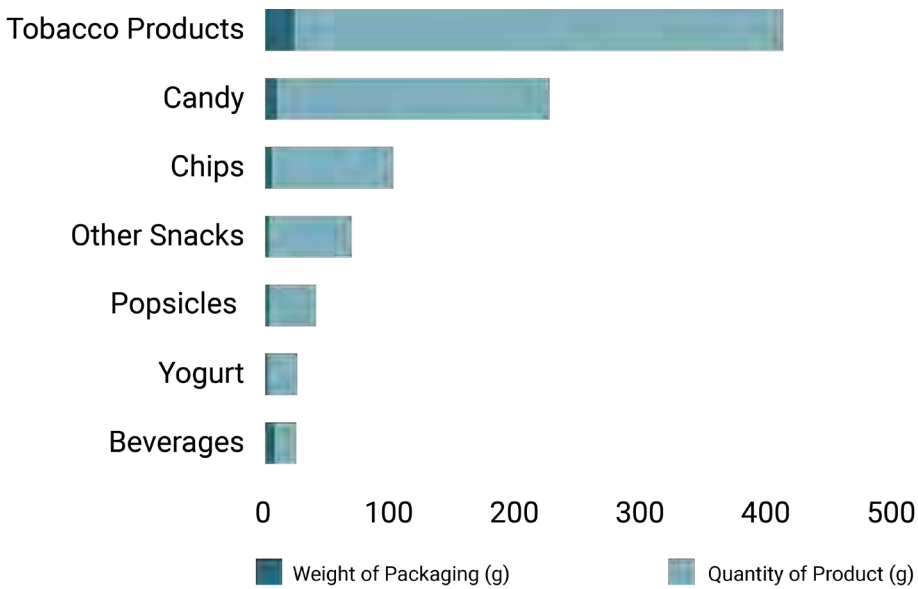
**Table 3:** Average weight of products and their plastic packaging for common convenience items

Product Type	Number of Samples	Average Weight of Plastic Packaging (g)	Average Quantity of Product (g)
Beverages	99	27.82	389.30
Candy	93	2.39	22.92
Chips	93	3.51	36.96
Tobacco Products	61	7.75	16.98

Product Type	Number of Samples	Average Weight of Plastic Packaging (g)	Average Quantity of Product (g)
Other Snacks (bars, cookies, nuts)	50	2.74	65.94
Popsicle	18	5.42	96.50
Yogurt	14	9.21	217.14

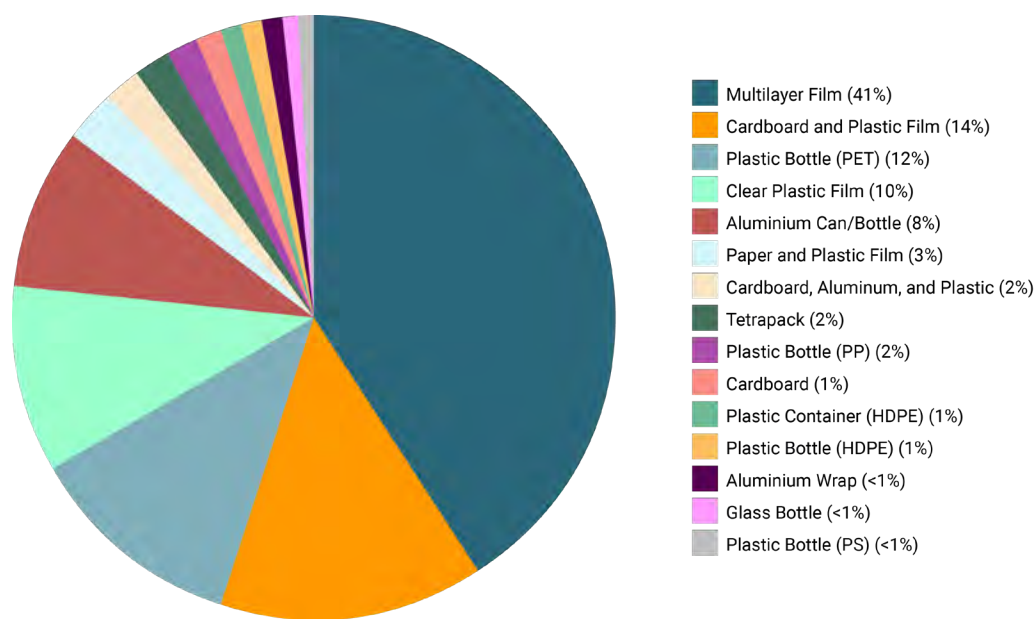
Beverage products on average had the highest packaging and product weight on average, though tobacco products had the highest ratio of packaging weight to product weight. Other snacks and yogurt had the lowest ratios of packaging to product. Candy and chip products had a similar ratio, as did popsicles and beverages. Candy products had the lowest average weight of packaging and the lowest average weight of product.

Figure 4: Convenience Store product to packaging ratios, shown in grams



Of the top beverage products, 51% were packaged in some form of plastic bottle, while 36% were in aluminum containers, 8% in Tetrapak, 4% in glass, and the rest had multiple types of packaging. Of the candy products, 43% were packaged in multilayer plastic film and 22% were in clear plastic film. Only 5% of the candy products were packaged in a material that didn't contain any type of plastic, which was plain cardboard without an aluminum and plastic coating. Of the snack products category, which includes chips, bars, cookies, and nuts, the vast majority (90%) were packaged in multilayer plastic film and another 8% were in clear plastic film. Only 1% of snack products were not packaged in plastic, which were chip products from Pringles brand packaged in cardboard, but these did contain a plastic lid, metal bottom and the paper was coated in plastic, which is a design that is typically not recyclable. Popsicles were another popular convenience item and they were all packaged in either multilayer or clear plastic film. Among the containers for yogurt, another popular convenience item, half were made of PP and the other half were split between HDPE and PS. All of the top tobacco products were packaged in cardboard and wrapped in plastic film.

Figure 5: Material Breakdown of Top Convenience Store Items

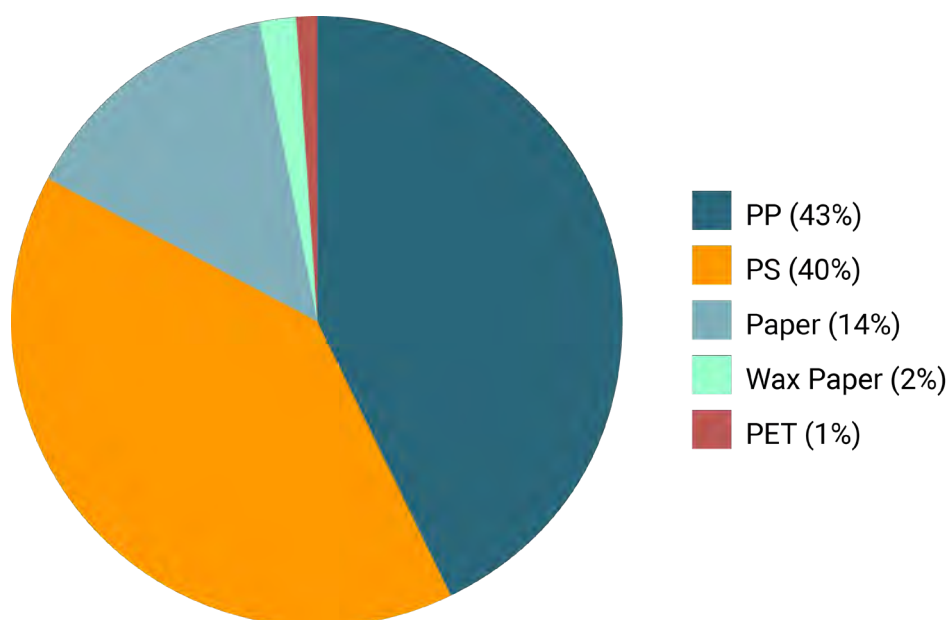


Within each of the selected nine 1km<sup>2</sup> transects in Panama City, the LIP also visited up to three randomly selected food vendors or to-go restaurants to sample the food packaging and utensil types that were being distributed, totaling 34 vendors sampled. The LIP collected 117 to-go items from those vendors and documented their weight, material type, and brand, where possible.

Table 4: Material type and average weight of common plastic packaging items from food vendors and restaurants in Panama City

Product & Material	Number of Samples	Average Weight (g)
Bag (paper)	8	10.93
Bag (plastic)	2	2.95
Bottle (PET)	1	9
Condiment Container (PP)	2	1.8
Condiment Container (EPS)	2	1
Cup (EPS)	21	3.21

Product & Material	Number of Samples	Average Weight (g)
Cup (paper)	7	11.1
Cutlery (PP)	22	4.18
Cutlery (PS)	1	2
Food Container (EPS)	14	6.21
Food Container (PP)	3	64.33
Food Container (wax paper)	3	3.2
Lid (PP)	7	4.02
Paper Wrapper	1	3
Plate (PS)	1	2.85
Stirrer (PP)	3	0.2
Straw (PP)	11	0.9
Tray (EPS)	3	7.66

**Figure 6: Material breakdown of the to-go items sampled**

One vegetarian restaurant and one pizza shop offered entirely plastic-alternative products, while the vast majority offered plastic (largely PP or EPS items). Paper items represented 14% of the to-go items sampled, which were predominantly paper cups (likely lined with plastic) that were offered as an alternative to foam cups.

## Use

All of the 32 grocery and convenience stores sampled for top products, plus an additional 10 mini markets, were surveyed for the type of bag that they provide to consumers and the associated price. In total, 58 bags were documented for their size, weight, and material type. Of the 42 stores, only four offered compostable PLA or paper bags, and four did not provide bags to consumers at all.

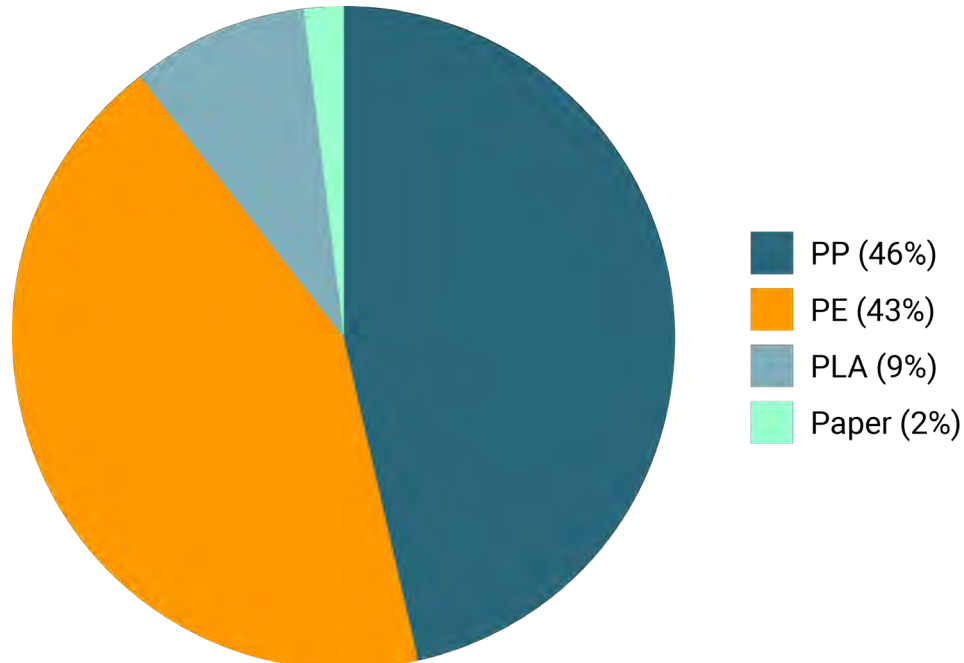
**Figure 7:** Example of traditional PE (left) and PP (middle) grocery bags and compostable PLA and paper alternatives (right) offered at grocery stores in Panama City



(Photo Credit: CEASPA)

Of the 58 grocery bags samples, the most popular material type (representing 46% of bags) was PP, offered by 22 stores, followed by PE which was offered by 17 stores, and 6 stores offered both PP and PE bags. Another 9% of the bags were a compostable PLA material, while 2% were made solely of paper.

**Figure 8:** Material Breakdown of Bags from Grocery and Convenience Stores



Based on the bags sampled, the compostable PLA bags are the same price to consumers as the traditional PE bags, while paper bags are slightly more expensive and PP bags are the most expensive to consumers by over \$0.20 per bag. The PE bags are intended to only be used for vegetables and meat products and are not intended to be used for regular merchandise, according to the current plastic bag laws in Panama City. However, it was noted in the inter-



views that when plastic alternatives cost more than the standard plastic options, consumers will always go towards the option that is most affordable for them.

“... the cost of the plastic bag versus the other is one of the deficiencies as well, because at the end of the day people are going to pay what they think they can afford, not what they should and what the conscience says.”

— Recycling Company

Table 5: Cost of Alternatives from Stores and Vendors

Product Type	Alternative Material Type	Average Cost of Alternative to Consumer	Average Cost of Traditional Plastic to Consumer
Plastic Grocery Bag	Compostable (PLA)	\$0.08	PE — \$0.08 PP — \$0.36
Plastic Grocery Bag	Paper	\$0.10	PE — \$0.08 PP — \$0.36

Figure 9: Photo of all the grocery and convenience store bags collected by LIP in Panama City



(Photo Credit: CEASPA)

Panama City has five predominant supermarket chains that can be found throughout the city, which include El Rey, Machetazo, Xtra, Super 99 and Riba Smith. These markets often offer reusable bags that are made from woven or

pressed PE or PP that are branded with their name or advertisements. While these are still composed of plastic and are offered at a higher cost than the bags from the survey by the LIP — typically ranging from \$0.39 to \$0.99 for smaller ones and from \$1.25 to \$1.75 for larger ones — they can be reused and are not considered single-use.

**Figure 10:** Examples of reusable woven/pressed PE or PP grocery bags typically distributed by the top chains of supermarkets in Panama City



(Photo Credit: CEASPA)

Although these bags are reusable, many stakeholders in the interview process told us they often forget their bags and purchase new ones.

**"I'm a housewife and a mother. I buy my groceries. I have my children, so when I get off work, I have to run, as any housewife does, to the supermarket because, if I don't, my children won't eat, and I see that culture. Very often, I forget my bag, so I have like 50,000 bags at home because we're like the times when we were in school, "I forgot my homework." Now, it's, "I forgot my bag."**

**— Government Official**

Based on surveys of convenience product supply stores, for food vendors and restaurant owners the average cost per packet for paper cups of various sizes is around \$3.29, whereas the average cost for PS cups is about half the cost at around \$1.62 per packet. Similarly, the average cost for paper food containers is around \$6.15 per packet, while plastic food containers are on average around \$4.45 per packet and are offered in a wider range of sizes and options such as clamshells, compartment containers with lids, plates, and large and small soup containers. Plastic cutlery was on average \$0.84 per carton, and plastic alternatives for cutlery didn't appear to be readily available for purchase in supply stores in Panama City.

**Figure 11:** Examples of plastic-alternative paper and compostable to-go options available to store owners in Panama City



(Photo Credit: CEASPA)

Social pressure and environmental awareness campaigns had encouraged some businesses to reduce plastic use.

**“We stopped using straws because of the strong campaign going on.”**

— Restaurant

It was apparent in the stakeholder interview process that cost is a major barrier for businesses to transition to plastic alternatives. It was noted that some of the larger corporations are able to afford the transition, or are able to afford the fines, but that the cost difference disproportionately hits smaller businesses and lower income areas of Panama City.

**“Yes. [Bigger corporations] have the resources. They don't have any incentive. We are getting used to fines. How is the country promoting the use of different packaging if there's no incentive for alternatives, so it could develop in the areas of higher economic income and also in areas of lower income. We have to make it more equitable. In the end, the cost is going to play a big part for regular people because they go where prices are lower, including me. So in the end, there's the disadvantage that people want things cheaper, they aren't going to pay more for what they need.”**

— NGO

**“Regarding the cost, [switching to alternatives] is more expensive, and that is what we figured out initially. Of course, non-biodegradable products**



**cost, say, \$0.02. The biodegradable one may cost \$0.05 or \$0.04. In this business, you measure things penny by penny; everything adds up.”**

**— Restaurant**

There was a sentiment among interviewees that the general public in Panama City uses disposable products consistently, and reusable products are not the normal practice and are typically reserved for special occasions.

**“Only on birthdays do you use normal plates and glasses.”**

**— Informal Recycling Aggregator**

Refill and reuse schemes were not common practice in Panama City. Several businesses and restaurants are starting to use alternative items such as paper and compostable or biodegradable plastic, but often these also have waste disposal and management challenges associated with them as well.

## Collection

Waste generation per capita in Panama is estimated to be about 1.2 kg/day, which is one of the highest in the region (Alcaldía de Panamá 2018)—higher than the global average of 0.74 kg/person/day as well as the regional Latin America and Caribbean average of 0.99 kg/person/day (Kaza et al. 2018). A little under 60% of the population of the country of Panama has access to controlled municipal solid waste disposal services (Hettiarachchi et al. 2018). This number is estimated to be 87% within the urban area of Panama City (Banco Interamericano de Desarrollo 2015). Waste collected in Panama City is not segregated at the source; rather, all waste goes together in a plastic bag to the landfill.

**Figure 12:** Images of public waste receptacles and areas for household waste collection in Panama City — standard metal container (left), basket (middle), and tinaquera (right)



(Photo Credit: CEASPA)

Dump areas within the city are called “Patanconcito” or little “Patacón”, after the city landfill. As shown in Figure 12 above, several common types of collection bins exist in Panama City. “Baskets” are metal containers to deposit waste bags, which sometimes have a metal screen. Bags and boxes are often left in the bottom or a side of the basket if there is inadequate space inside the bin. Serving a similar purpose, “tinaqueras” are waste deposit sites constructed mainly with cement blocks, with or without doors. These types of bins are often located in common areas, although city regulations say that all baskets and “tinaqueras” should be located on private property.

**Figure 13: Examples of household (left) and commercial (right) waste collection receptacles**



(Photo Credit: CEASPA)

Informal housing represents 47.6% of the surrounding area of the city (data provided by the Instituto de Estadísticas y Censos — Panamá 2020), so populations living in these conditions transport their bags of waste to the nearest access road with or without collection service. This reality produces piles of unwanted garbage along roads and bridges. When a community designates an area for waste disposal, informal businesses may also dump waste in the area; these informal dumpsites may contain domestic waste, appliances, tires, bulky objects and commercial waste. There are also reports of low-income areas of Panama City that do not have access to waste management services dumping waste into rivers. Panamanians say that a lack of collection containers and space for trash bags is a major issue (INECO 2017).

Where service does exist, the quality of the collection service is sometimes low, with inconsistent schedules and frequency that are not communicated to the public. While public/private partnerships are a growing way to fill the gaps, contracts between the municipality and private companies are often lax in terms of collection schedules and frequency and vehicle maintenance, among other considerations (Banco Interamericano de Desarrollo 2015).

**“Garbage collection in the community is very scarce, the car comes almost from month to month collecting the garbage, but not frequently collecting the garbage in the streets. They are not collected in homes. [There] is an area where people throw their garbage there, they come in 20 days to a month and take it to the landfill. The garbage is charged on the electricity or water bill, the receipt comes, so the garbage is paid and two dollars is the fee. Usually everyone should pay for the trash... There are people in the community who cannot afford it.”**

— Informal Recycling Aggregator

Of the waste receptacles documents during the CAP surveys, the majority were household waste bins, largely baskets outside of residential housing. Transect areas with higher amounts of public waste bins, such as transect areas 1, 5, 7, 8, and 9 reported waste bins that were overflowing. Transect 6 was the exception, which had a high number of public waste bins, but they were well maintained and located in the Airport area that does not receive high amounts of foot traffic. Transect 1 had the highest number of overflowing waste receptacles—twice the number found in the other areas—which were mostly household baskets or informal dump sites in residential areas. Those that were overflowing in other transect areas were mostly informal dump sites or public bins in high traffic areas or areas with high amounts of public housing. Transects that reported no overflowing bins, including transect areas 2, 3, and 4, were in residential areas that were reportedly well maintained or in the Natural Metropolitan Park. Counts for public recycling bins and informal recycling locations were low across all transect areas.

**Table 6: Documented public waste collection and accumulation in the 1km<sup>2</sup> litter transect areas of Panama City**

Transect	Residential waste bins	Commercial or Business waste bins	Public waste bins	Dump Sites	Recycling bins	Informal Recycling
1	664	80	51	38	3	1
2	171	1	0	0	0	12
3	125	0	0	0	0	0
4	1	4	2	0	0	0
5	22	275	76	2	1	0
6	0	0	202	0	0	0
7	90	3	19	0	1	0
8	61	9	48	9	0	8
9	2	27	95	31	8	0
<b>TOTAL</b>	<b>1136</b>	<b>399</b>	<b>493</b>	<b>80</b>	<b>13</b>	<b>21</b>

The urban area of Panama City is encompassed in two districts: Panama and San Miguelito. The “Autoridad de Aseo Urbano y Domiciliario” (AAUD)(state agency), established in 2010, provides the waste collection services for municipalities within the Panama district (Banco Interamericano de Desarrollo 2015). AAUD offers door-to-door collection 2 days a week for \$5-12 per month, depending on property type (Grajeda et al. 2019). Serviaseo (a private company) provides the waste collection services for San Miguelito district. Both transport the waste to Cerro Patacón Landfill. Urbalia S.A. (private company) operates the landfill. There are several private companies that provide waste collection services to the industry, condominiums, and private communities.

**“In my district of San Francisco, in the Punta Paitilla area, waste collection is done by the Waste Authority from point to point. However, for recycling I pay for a personal collection called Llipsinc. In my building there isn’t a recycling point, but I know that other neighbors are also using the same method that I am using for recycling. So we do not have a separation within the building as others have to**



**separate waste from recyclables. In the community sometimes they collect waste by NGOs, however it is not something constant and less so with the covid."**

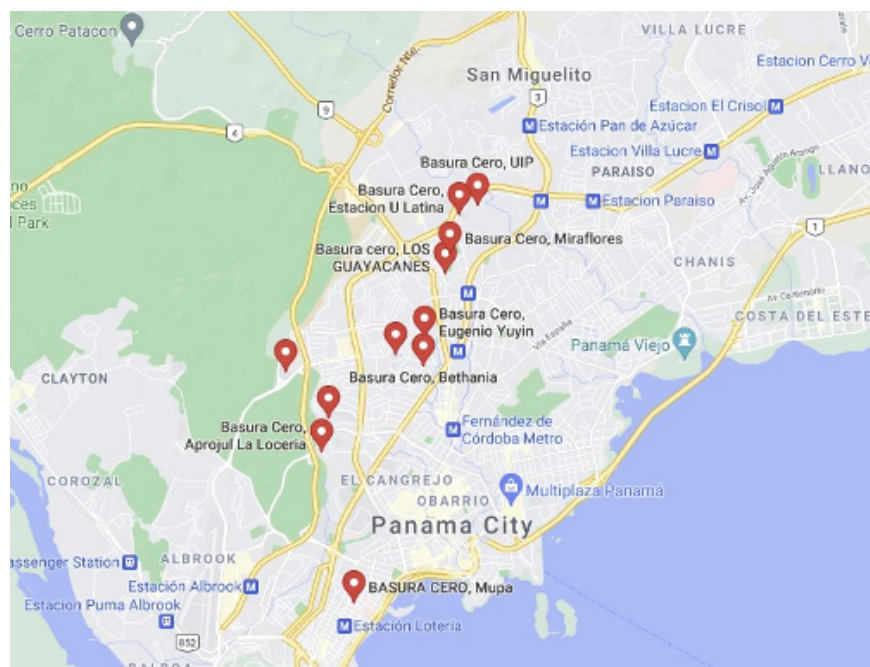
— NGO

At the national level, Law No. 6 passed in 2018 "establishes integrated waste management in public institutions" by ordering public institutions to sort their waste and undertake recycling schemes for paper, plastic bottles, Tetra Pak containers and aluminum cans (Ávila 2017). Also passed in 2018 Law No. 3 established the Zero Waste Policy for an integrated solid waste management plan, which mandated that municipalities are responsible for the establishment of recycling systems (UNEP 2018).

Historically, recycling has been provided privately and often informally. The private informal sector consists of locals who collect and sort recyclables to resell to private companies; there is a large network of these informal workers operating on Cerro Patacón, often at risk to their health and safety (INECO 2017). (See End of Life for additional details.)

More formally, the Zero Trash Program (Basura Cero) (2015-2035) is a pilot public-private program based on a circular model that aims to educate the public about proper waste management, has placed recycling bins and drop-off locations around the city, and spreads the message of "Reduce, Reuse, Recycle," (ANCON 2019). The service is free of charge. Basura Cero accepts separated paper, PET and HDPE plastics, tetrapaks, aluminum, and cardboard (Alcaldía de Panamá 2018-b). There are recycling drop-off locations in the corregimientos of Betania, Chilibre, and Tocumen. People can search "Basura Cero" on Google Maps to find locations near them. Basura Cero is an alliance between private company Cervecería Nacional, nonprofit organization ANCON, and public entities, the Municipality of Panama and the AAUD (Alcaldía de Panamá 2018-a).

**Figure 14: Example of Basura Cero locations in Panama City on GoogleMaps**

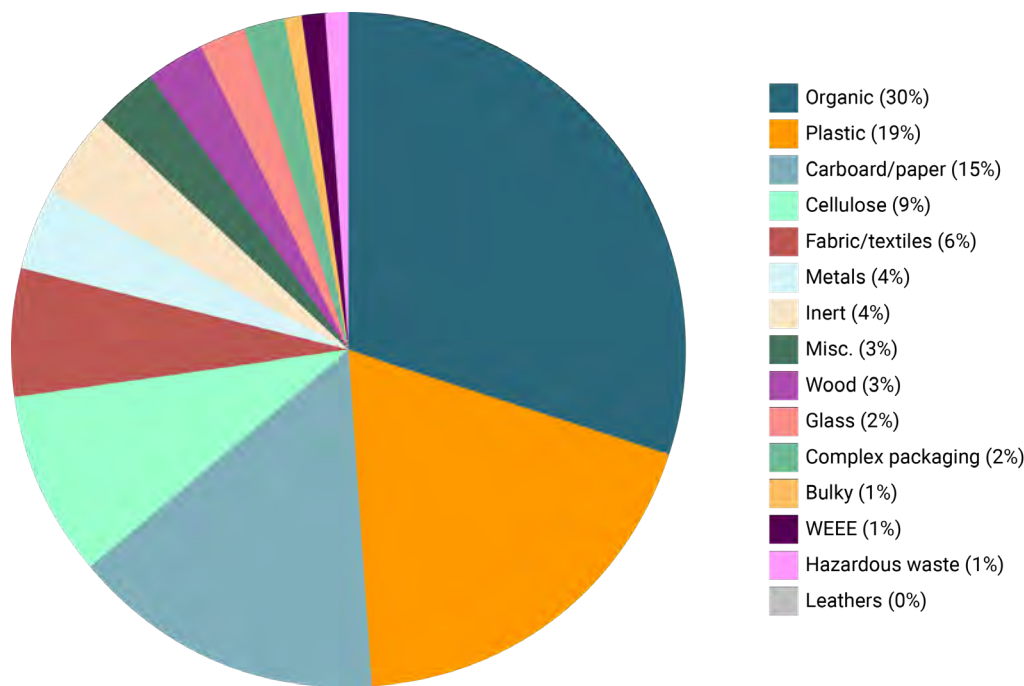


## End of Cycle

It is estimated that about 65% of municipal solid waste generated in Panama City is disposed of in sanitary landfills, and about 2% of wastes are separated for recycling (Banco Interamericano de Desarrollo 2015). Panamá and San Miguelito Districts use Cerro Patacón landfill for all types of waste, including municipal, industrial, construction, domestic and others. There is no other official dump site in the area.

Cerro Patacón Landfill is the only landfill in Panama City and is operated by Urbalia, which just had a landslide accident in June 2021 (see further information below). It processes approximately 2,300 tons of garbage per day (Hettiarachchi et al. 2018) and accepts municipal solid waste, sewage and industrial sludge, used tires, clinical waste, and construction and demolition waste (Torrente-Velásquez et al. 2020). Approximately 60% of waste received by the landfill is biodegradable (Torrente-Velásquez et al, 2019). Composition of waste received in the landfill is shown in Figure 15 below.

**Figure 15: Waste Composition of the Cerro Patacón landfill**



(INECO 2017)

Of the waste disposed of in Cerro Patacón, approximately 1,000 tons are from the Panama district and 350 tons are from the San Miguelito district. Other large components of the waste, totaling around 500 tons, are: waste from private businesses, sludge, tires, and hospital waste. A smaller fraction, around 50 tons, includes waste from street sweeping, park and garden maintenance, and bulk waste (Banco Interamericano de Desarrollo 2015).

Since Cerro Patacón opened in 1986, waste disposal has increased by an average of 3.5% per year, largely due to higher than anticipated immigration rates and economic growth. Cerro Patacón was initially designed with a planned closure date of 2037, but due to higher waste generation and disposal rates it is now anticipated that the landfill will be full by 2022. In 2016, the permitted maximum elevation of slopes was raised to 145 m as a measure to extend landfill capacity; this, however, increases the risk of hazardous gas dispersion for nearby communities (Torrente-Velásquez et al, 2019), as well as other environmental and safety risks.

Approximately 73,600 inhabitants in nearby areas are affected by low-concentration, long-term hazardous air pollutants (HAPs) generated from Cerro Patacón. Waste dumped is not covered, leading to a high risk of open fires and pollutant leakage into water sources (Torrente-Velásquez et al, 2019). As recently as June 2021, heavy rains caused a landslide at the landfill in a section that had been closed several years ago. This caused leachate from the landfill to overflow, inflicting damage on the leachate treatment plant and incineration plant and contaminating the surrounding Guabinoso River (Forbes 2021). The Minister of Environment characterized the event as an “environmental and sanitary disaster, and the government puts the blame on Urbalia for their operation of the site. It is unclear if any community members were directly injured as a result of the landslide, but most definitely the environment is impacted as well as the potential for longer term health impacts (MRT 2021). Urgent action needs to be taken to address and mitigate the risks posed by the landfill and prevent future harm to the local residents and the local environment.

One of the groups most affected by safety concerns on Cerro Patacón is the informal recycling sector. Some informal waste aggregators will collect recyclables directly from the landfill. While informal sector workers in Panama are doing significant work to strengthen waste management systems, their role has often been unrecognized and undervalued (Movimiento Nacional de Recicladores de Panamá 2018).

**What I want to convey, and I am not speaking only for myself, but for all recyclers, is that the problem I see is that they have not been given the opportunity to participate more at the state level and to be hired themselves and endorsed as businesses.”**

**— Private Recycling Company**

In 2018, the Movimiento Nacional de Recicladores de Panamá (National Movement of Panamanian Recyclers) conducted a census that found 234 informal recycling workers in the province of Panama. 213 of these were operating on Cerro Patacón. On average, each informal sector worker had four dependents, meaning that informal recycling activities support nearly a thousand people in the area. Informal sector recyclers collect materials with a resale value; items collected as reported by informal workers surveyed include aluminum cans, copper, iron, aluminum, bronze, electronic scraps, paper, car batteries, cardboard, jewelry, newspaper, plastic bags, bottles, rags, rigid plastics, gallon jugs, magazines, and Tetra Pak. While the majority of workers reported collecting metals and over 25% reported collecting paper products, only 4.2% reported collecting plastic bags, 4% reported collecting bottles, and 3.8% reported collecting rigid plastics (2018).

Similar sentiments were reflected in interviews conducted with informal recyclers by our team; the low levels of plastic recycling seem to be driven by the lack of an upstream recycling market for the material in Panama.

**“That is the price flat rate for all buyers, and they keep between 3 to 4 buyers at night**

in the landfill. And those who collect choose whom they are going to sell or to whom they are not selling. The one that treats them the best obviously is chosen.”

— Informal Recycling Aggregator

“No there is no control, the material is not weighed. What I can tell you is in normal times we could be getting 25 to 30 Tons per month. Everything, iron, everything, everything. The heaviest is iron. And in plastic, cardboard, all that is collected. I wanted to tell you something, right now we are one of the smallest buyers in the landfill. There are buyers who take 60 to 70 tons a month.”

— Informal Recycling Aggregator

“Iron, scrap, paper, copper. Paper and paperboard. Not plastic because it is a problem. Because there are not many companies that buy plastic.”

— Informal Recycling Aggregator

“Look, plastic here in Panama is a material very poorly paid, that is one of the problems because people do not dedicate themselves to collecting plastic since we have knowledge with businessmen who are from other areas and plastic in their country fluctuates between 0.40 and 0.60 cents per pound. Here the highest price that has been in plastic has been up to 0.8 cents, because currently instead of improving the price of plastic, it has deteriorated. And that is one of the systems, if there was a better price and there was a stable company that would buy it from us, of course we as recyclers would collect the plastic. I think that since it is a bulky product and it is a product that takes up a lot of space, that is a product that should be between 0.20 and 0.25 cents here in Panama and I assure you that this way, a lot of plastic would be collected because here a lot of plastic is lost in all areas in the garbage system.”

— Informal Recycling Aggregator

“What happens is that plastic is the same as the metallic products that one sells, some are of low quality and others of high quality. HDPE and another product that I can remember the name costs up to 450 a ton, it is difficult to collect. The one from plastic bottles is the most valued, that was the one that had the most value, but there is another one that we call junk plastic, which are the handlebars as you say, toys that are plastic, I think it's like everything, that goes in with a different value. But the most sought after should be between 0.20 to 0.25 cents a pound.”

— Informal Recycling Aggregator

The Zero Waste (Basura Cero) program is currently in a pilot phase, with hopes to expand nationally. As part of this program, there are a series of “Punto Limpio” recycling collection areas throughout the city which accept paper,

PET, HDPE, carton, Tetra Pak, and aluminum cans. The LIP noted that these cans are often cleaned out three times a week, though service has been variable during the COVID-19 pandemic. In the three years since its establishment, the public-private partnership collected more than 150 tons of recyclables including cardboard, plastic, aluminum cans, Tetra Pak, white paper, and newspaper (ANCON 2019). Recycling among residents is typically done by bringing their products to a given drop-off location, though there are several smaller collection companies such as Conviert3 and Bliss Circular Economy that charge between \$7 and \$13 per month depending on the number of pickups.

**Figure 16:** The outside and inside of a Basura Cero collection bin in Miraflores



(Photo Credit: CEASPA)

While the team surveyed many compostable and biodegradable items in stores, there is no industrial compost facility in Panama City, which leaves the compostable products to end up in landfill or potentially contaminating other waste streams. However, there are local programs that compost the organic material from local jails and local restaurants, such as Geo-Azul which uses organic waste to create fertilizer. Geo-Azul typically charges \$27 for two pickups per month along their routes, which is higher than typically private recycling collection companies.



## Leakage

**Figure 17:** Examples of litter items in Panama City

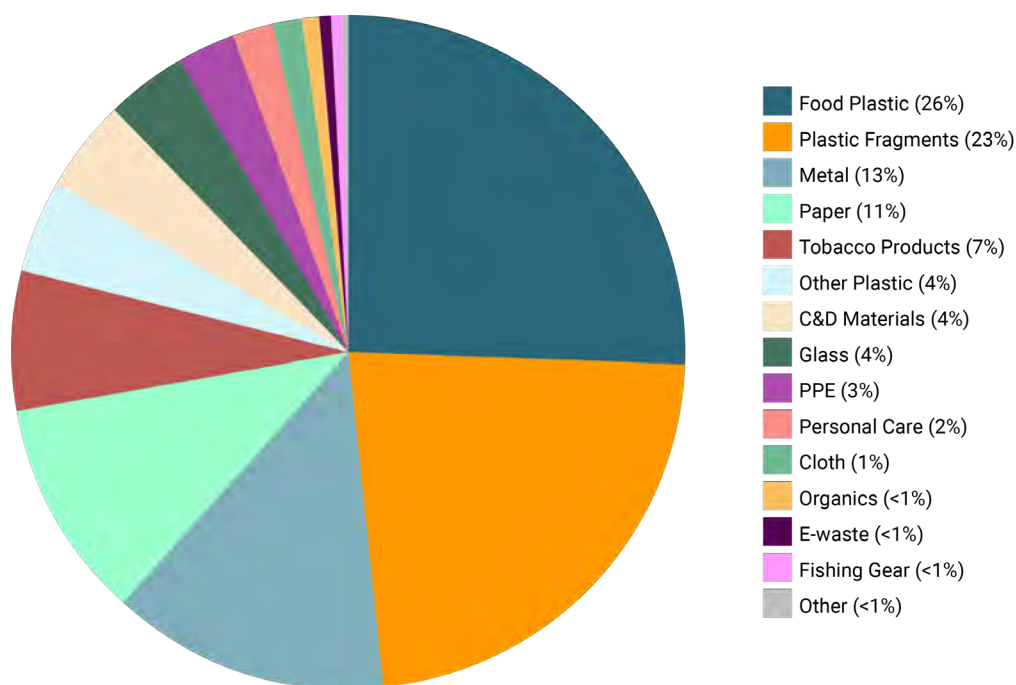


(Photo Credit: CEASPA)

In total, 5,712 litter items were recorded across 27 100m<sup>2</sup> transects in nine different square kilometer areas sampled between October 2020 and March 2021. Litter transect locations were selected using a stratified random sampling method, in which transects were randomly selected in nine square kilometers which were distributed across three groups of population count (upper, middle, lower) based on LandScan ambient population data. Litter items were re-recorded using the open source [Marine Debris Tracker](#) app. A full list of items available in the app and their associated material categories can be found in the Appendix.

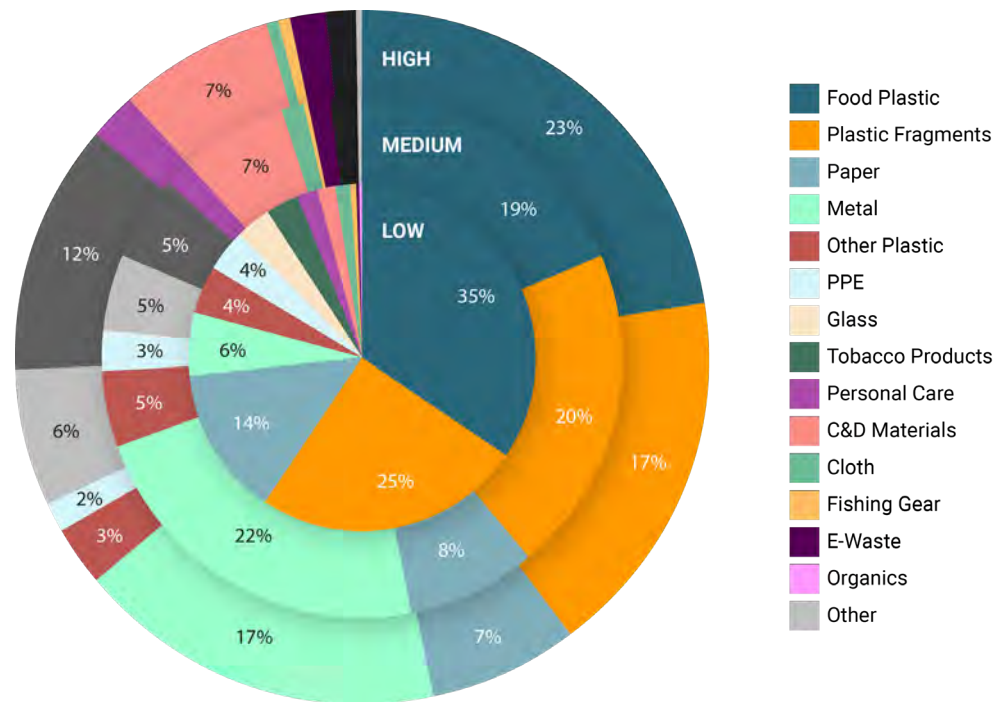
Across all 27 transects, the largest percentage by category of litter items was food plastic (such as plastic packaging for food products), followed very closely by plastic fragments. Metal, paper, and tobacco products comprised between 13% and 7% of items; other plastic, C&D material, glass and PPE represented between 3% and 4% of all products sampled respectively; all of other material categories including personal care items, cloth, organics, e-waste, fishing gear and other materials formed 2% or less of the total litter count respectively (Figure 18). The total percentage of common plastic items (the sum of food plastic, plastic fragments, other plastic, PPE, and personal care items) found was 58% of the total items.



**Figure 18: Material Breakdown of Litter in Panama City**

When examining the litter characterization based on the population count, we see some distinctions can be seen between the three groups (Figure 18). In terms of material type, food plastic and plastic fragments were dominant in the lowest population count areas, while metal was the most common litter material in the middle population count areas, which was in the form of metal bottle caps/tabs as well as bolts, nails, and screws. Food plastic was the most common material found among litter items in the highest population count areas and plastic fragments and metal items were tied for the second most common. Tobacco products represented 5% or less of the litter items documented in middle and lower population count areas, while in the highest population count areas tobacco products represented 12% of all litter documented and cigarettes were the most abundant litter item.

**Figure 19:** Proportion of most common plastic items in low (inner), mid (middle), and high (outer) population count areas in Panama City



Distinct patterns can also be seen between population count areas in terms of individual litter items. Film fragments were among the top five items in all three of the population count areas. Cigarettes were the most abundant item in the upper population count areas but were not among the top five most common litter items in the middle or lower population count areas. Metal bottle caps or tabs and construction items such as bolts, nails, and screws were common in both the upper and middle population count areas. The high and medium population count areas also had the highest counts of stores and restaurants present. Plastic food wrappers and additional types of plastic fragments beyond film, such as hard plastic and foam items, were abundant in the middle and lower population count areas.

**Table 7:** Litter Density and Top Litter Items from all Transects in Panama City

Population Tertile	Top 5 Litter Items	Litter Density (count/m <sup>2</sup> )
Upper (5,333 — 24,081 persons/sq. km)	1) Cigarettes, 2) Film Fragments, 3) Metal Bottle Caps or Tabs, 4) Straws, 5) Bolts, Nails & Screws	1.87
Middle (557 — 5,333 persons/sq. km)	1) Metal Bottle Caps or Tabs, 2) Film Fragments, 3) Bolts, Nails & Screws, 4) Plastic Food Wrapper, 5) Hard Plastic Fragments	1.43
Lower (0 — 557 persons/sq. km)	1) Film Fragments, 2) Plastic Bottle, 3) Plastic Food Wrapper, 4) Foam Fragments, 5) Foam or Plastic Cups or Lids	3.04

In the Caribbean, litter densities from 0.475 to 2.52 have been reported (Courtene-Jones et al. 2021) and in the South Asia region estimates range from 0.5 items/m<sup>2</sup> to 15 items/m<sup>2</sup> with an average of around 4-5 items/m<sup>2</sup> (n = 40) (Youngblood et al, In Review). Litter densities across Southeast Asia (Indonesia, Malaysia, and Vietnam) range from 0.75 to 3.39 items/m<sup>2</sup> with an average of 1.83 items/m<sup>2</sup> (n = 27) (Urban Ocean). The litter density in Panama City is higher than most of the regional estimates and is closer to the averages found in South and Southeast Asia.

One of the highest densities of litter per 1km<sup>2</sup> transect area, with an average litter density of 3.25 items/m<sup>2</sup>, was at the high population count area of Mercado del Marisco, which also had the highest recorded number of storm drains (10), restaurants/food vendors (107), and stores (137) among all of the 1km<sup>2</sup> transect areas. That same square also had among the lower counts of public waste bins (159) and the second highest number of dump sites per transect area (31), though it did have the highest number of recycling bins (8) of all of the transect areas.

**Figure 20:** Example of storm drains clogged with debris and litter in the Mercado del Marisco area



(Photo Credit: CEASPA)

Interestingly, the 1km<sup>2</sup> transect area that had the highest average litter density of 7.48 items/m<sup>2</sup> was in the low population count area of Albrook Avenida Principal that was estimated to have no restaurants and only one retail store. That area also had a relatively low number of waste bins and no recycling bins available to the public that were documented within the litter transect areas.

The lowest litter density among the 1km<sup>2</sup> transect areas by a large margin was found in the Residential Albrook Area, which on average had 0.24 items/m<sup>2</sup>. This area also had 329 waste bins, among the highest documented from the litter transects, and 12 informal recycling locations.

## Opportunities

Panama City and the country of Panama at-large have taken steps towards becoming a leader in South America on managing plastic pollution and implementing plastic policy. With urban population growth on the rise and ageing waste management infrastructure that has serious human and environmental health impacts (e.g, the recent Cerro Patacón Sanitary Landfill environmental disaster), it will be critical for Panama City to ensure that its residents and businesses are provided with waste collection and plastic alternatives that are straightforward, accessible, and economically incentivized where possible. Associated practices and policies should be made clear to all sectors and demographics in a way that is most relevant to the context of Panama City.

We recommend exploring the following opportunities to expand and enhance circularity in Panama City based on the findings of this report. These opportunities are categorized based on the seven spokes of the CAP model and are roughly listed based on the level of potential impact to reduce plastic waste in Panama City within each spoke. The purpose of the forthcoming Opportunity Assessment Workshop in Panama City as part of Urban Ocean is for the city to further prioritize these opportunities based on impact, feasibility, and cost. It is important to note that the opportunities listed below are individualized based on the findings, but solutions cannot happen in a vacuum and are most impactful when strategically combined within a holistic system framework.

### INPUT

- Especially for companies and manufacturers that are located within Panama City, conversations about items of high leakage or those that are challenging to manage at end-of-life should happen. They should explore partnerships to reach tangible targets around waste leakage and litter reduction for the most problematic items.

### COMMUNITY

- There are strong current policies planned and on paper, but there is not much faith or trust in the current laws and bans that exist related to single-use plastic and recycling requirements in Panama City — enforcement and public awareness around those policies could become more consistent across the city.
- More regular collection schedules and/or better communication about collection schedules could result in less aggregation of trash at pick-up points and less opportunity for leakage into storm drains and waterways.

- Revisiting data collection methods from the CAP over time to determine efficacy of recent policies on single-use plastic could be beneficial to both measure the impact and to show the Community the positive effect that the policies are having and help bolster support and awareness.

## PRODUCT DESIGN

- As film products appear to be the most abundant and one of the most problematic litter items, there could be an opportunity to work with local stores to rethink delivery of some of those products or incentivize EPR – or ideally incentives for film alternatives – for producers and distributors.
- A relatively high percent of to-go items were EPS, which, as a material, is challenging to collect and recycle. In addition, alternatives exist for many of the applications of EPS. Since some of those alternatives were observed in the survey, EPS is a material that could feasibly be phased out of the city, and this data may be useful for implementation of Law 187.

## USE

- Panama City can explore a refill or reuse option available for household goods or popular grocery goods, as similar models have worked in other locations in South America like in Chile, where the refill company “Algramo” started and has been become highly successful. Disposable and single-use products are currently more readily used in Panama City, as they are more affordable and abundant, but the fact that some businesses still choose to use paper or compostable plastic items may indicate that reuse options could be viable in the city.

## COLLECTION

- Door to door collection in the city could be expanded to reach a higher percentage of residents.
- Programs in household waste segregation should be explored to optimize collection and processing of waste, and further research should be done into the willingness of residents to sort their waste and what associated outreach may be required to make the program sustainable.
- The fact that residents have experience and show a willingness to bring trash for recycling to a designated location for aggregation could present opportunities for both source segregation and disposal opportunities for items that are not readily recyclable or compostable.
- The availability of public waste bins and recycling bins should reflect the population count and business activity within the area, and some parts of Panama City may consider increasing the number of bins that currently exist (especially recycling).
- Since waste baskets and “tinaqueras” are required to be on private property, there may be opportunities to replicate waste congregation areas like that, which are readily recognizable, in public places where residents may not have access to them on their private property.

## END OF LIFE

- The Cerro Patacón landfill is an emergency and needs immediate attention. Necessary improvements should be installed to provide safe and secure operation and protection of human health and the environment., In addi-

tion closing the facility earlier than intended and/or developing a new sanitary landfill that can service the area more effectively should be explored.

- Panama City conduct a feasibility study for installing an industrial composter to collect the compostable PLA plastic items that are being used at local businesses, as well as the large percentage of organic matter that constitutes the waste stream in the city – this should be coupled with public awareness around what those items are and how to properly dispose of such items.
- Economic incentives should be explored that can increase the cost of recyclable plastic products so that they can provide a viable income for informal recycling aggregators in Panama City.
- Depending on the desire of the city and of the informal recycling aggregators, steps could be taken to formalize the recycling industry and, even without formalization, provide the sector with safer working conditions and more reliable value for products. Corporate, governmental, and NGO partnerships could be developed with the National Movement of Panamanian Recyclers, for example.
- The city should look into expanding upon the Basura Cero program and continue to monitor its effectiveness over the coming years. Similarly, it would be worth looking into a cost/benefit analysis of pay-per-amount recycling companies such as Geo-Azul and determine whether there may be opportunities to expand or to offset costs for citizens through partnerships.
- Developing a dump site that is separate from Cerro Patacón that could be dedicated to collection of industrial and construction waste as opposed to household waste may be a valuable step in reducing landfill quantities, as many of those products could potentially be repurposed.

## LEAKAGE

- Plastic film products and food wrappers are among the most problematic items and are often found as litter in Panama City. Targeted policies that are enforced and are accompanied with public awareness campaigns on alternatives, proper waste disposal, and the potential environmental damage of those items should be explored. If Law 198 proves successful, it would be useful to integrate some of these most problematic items into a scaled or expanded version of that policy. EPR initiatives would also be beneficial to target these items.



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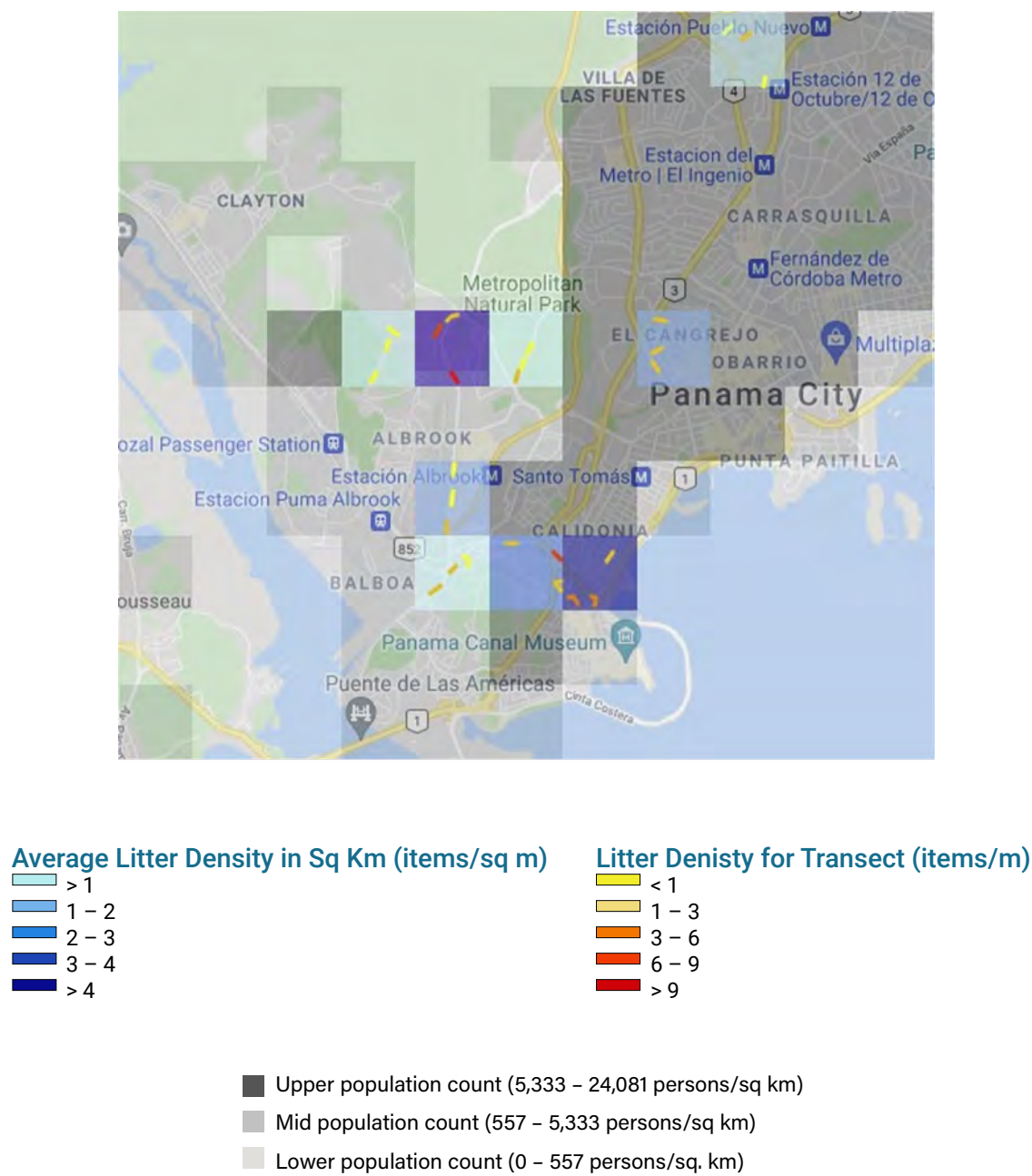
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# Appendix

Figure 21: Litter Densities in Panama City (population counts are shaded in gray)



**Table 8: Full List of MDT Litter Items and Associated Material Categories**

Material	Items
C&D Materials	Aggregate & Brick Bolts, Nails, and Screws Building Materials Lumber Other C&D
Cloth	Clothing Fabric Pieces Other Cloth
E-Waste	Batteries E-Waste Fragments Other E-Waste
Fishing Gear	Buoys and Floats Fishing Line Other Fishing Gear Plastic Net or Net Pieces Plastic Rope
Glass	Glass Bottle Glass or Ceramic Fragments Other Glass
Metal	Aluminum Foil Aluminum or Tin Cans Metal Bottle Caps or Tabs Metal Fragments Other Metal
Organic Waste	Food Waste Other Organic Waste
Other	Other Popsicle Stick
Other Plastic Products	Bulk Bags Flip Flops Other Plastic Plastic String, Tape, or Packing Straps Rubber Bands Tires

Material	Items
Paper	Coated Paperboard Corrugated Cardboard Multi-material Paper Box Noncoated Paper Food Wrapper Other Paper Paper Receipts
Personal Care Products	Blister Pack Cotton Buds Other Personal Care Product Personal Care Product Sachet Shampoo or Other HDPE Container Toothbrushes Toothpaste or Other Product Tube
Plastic Food Products	Foam or Plastic Cups or Lids Other Food-Related Plastic Other Plastic Bag Plastic Bottle Plastic Bottle Cap Plastic Food Wrapper Plastic Grocery Bag Plastic Utensils Straws Street Food Bowl Styrofoam Container
Plastic Fragments	Film Fragments Foam Fragments Hard Plastic Fragments Other Fragments
PPE	Associated PPE packaging Disinfectant Wipes Disposable Gloves Face mask packaging Face Masks Face Shield Hair nets Hospital shoe covers Other PPE

Material	Items
Tobacco Products	Cigarette Packaging Cigarettes Other Tobacco Product Tobacco Sachets

Table 9: List of all Manufacturers and Parent Companies of Top Convenience Items in Panama City

Parent Company	Parent Company Location	Manufacturer	Manufacturing Location
Agua Cristalinas	Panamá, Panamá	afua cristalina S.A.	Panamá, Panamá
ajegroup	Lima, Peru	ajecen del sur	cartago, costa rica
Alimentos Maravilla de Guatemala	Guatemala, Guatemala	Bonlac S.A.	Panama, Panama
Alimentos Maravilla de Guatemala	Guatemala, Guatemala	Bonlac S.A.	Panama, Panama
Alimentos Maravilla de Guatemala	Guatemala, Guatemala	Bonlac S.A.	Panamá, Panamá
Alimentos Maravilla de Guatemala	Guatemala, Guatemala	Bonlac S.A.	Panamá, Panamá
Ancalmo	San salvador, El salvador	Ancalmo	San salvador, El salva-dor
Ancalmo	San salvador, El salvador	Ancalmo	San salvador, El salva-dor
Ancalmo	San salvador, El salvador	Ancalmo	San salvador, El salva-dor
Ancalmo	San salvador, El salvador	Ancalmo	San salvador, El salva-dor
Ancalmo	San salvador, El salvador	Ancalmo	San salvador, El salva-dor
Anheuser-Busch InBev N.V./S.A.	Leuven, Belgium	Cervecería nacional de Pana-má	Panamá, Panamá
Arcor	Arroyito, Argentina	INDUSTRIA DE ALIMENTOS DOS EN UNO S.A.	Santiago,Chile



Parent Company	Parent Company Location	Manufacturer	Manufacturing Location
arcor	Arroyito, Provincia de Cór-doba, Argentina	Industria de Alimentos Dos en Uno S.A.	Santiago,Chile
Arcor	Arroyito, Argentina	INDUSTRIA DE ALIMENTOS DOS EN UNO S.A.	Santiago,Chile
Arcor	Arroyito, Argentina	INDUSTRIA DE ALIMENTOS DOS EN UNO S.A.	Santiago,Chile
arcor	Arroyito, Argentina	mundo ducle S.A.	toluca, mexico
Associated Brands Indus-tries Ltd	San Juan, Trinidad y Tobago	sunshine snacks limited	San Juan, Trinidad y tobago
Associated Brands Indus-tries Ltd	San Juan, Trinidad y Tobago	sunshine snacks limited	San Juan, Trinidad y tobago
british american tobacco	Londres, Reino Unido	british american tobacco México	Monterrey, Mexico
british american tobacco	Atlanta, U.S.A.	TAHSA	San Pedro Sula, Hondu-ras
british american tobacco	Atlanta, U.S.A.	british american tobacco México	Monterrey, Mexico
british american tobacco	Londres, Reino Unido	TAHSA	San Pedro Sula, Hondu-ras
british american tobacco	Londres, Reino Unido	british american tobacco México	Monterrey, Mexico
british american tobacco	Londres, Reino Unido	british american tobacco México	Monterrey, Mexico
british american tobacco	Londres, Reino Unido	british american tobacco México	Monterrey, Mexico
british american tobacco	Londres, Reino Unido	TAHSA	San Pedro Sula, Hondu-ras
british american tobacco	Londres, Reino Unido	british american tobacco México	Monterrey, Mexico
british american tobacco	Londres, Reino Unido	TAHSA	San Pedro Sula, Hondu-ras
british american tobacco	Londres, Reino Unido	TAHSA	San Pedro Sula, Hondu-ras

Parent Company	Parent Company Location	Manufacturer	Manufacturing Location
brittish american tobacco	Londres, Reino Unido	brittish american tobacco México	Monterrey, Mexico
brittish american tobacco	Londres, Reino Unido	brittish american tobacco México	Monterrey, Mexico
brittish american tobacco	Londres, Reino Unido	brittish american tobacco México	Monterrey, Mexico
brittish american tobacco	Londres, Reino Unido	TAHSA	San Pedro Sula, Hondu-ras
brittish american tobacco	Londres, Reino Unido	brittish american tobacco México	Monterrey, Mexico
brittish american tobacco	Londres, Reino Unido	brittish american tobacco México	Monterrey, Mexico
brittish american tobacco	Londres, Reino Unido	brittish american tobacco México	Monterrey, Mexico
brittish american tobacco	Londres, Reino Unido	TAHSA	San Pedro Sula, Hondu-ras
brittish american tobacco	Londres, Reino Unido	TAHSA	San Pedro Sula, Hondu-ras
brittish american tobacco	Londres, Reino Unido	brittish american tobacco México	Monterrey, Mexico
brittish american tobacco	Londres, Reino Unido	TAHSA	San Pedro Sula, Hondu-ras
brittish american tobacco	Londres, Reino Unido	brittish american tobacco México	Monterrey, Mexico
brittish american tobacco	Londres, Reino Unido	TAHSA	San Pedro Sula, Hondu-ras
brittish american tobacco	Londres, Reino Unido	TAHSA	San Pedro Sula, Hondu-ras
brittish american tobacco	Londres, Reino Unido	brittish american tobacco México	Monterrey, Mexico
brittish american tobacco	Londres, Reino Unido	brittish american tobacco México	Monterrey, Mexico
brittish american tobacco	Londres, Reino Unido	TAHSA	San Pedro Sula, Hondu-ras

Parent Company	Parent Company Location	Manufacturer	Manufacturing Location
brittish american tobacco	Londres, Reino Unido	TAHSA	San Pedro Sula, Hondu-ras
brittish american tobacco	Londres, Reino Unido	TAHSA	San Pedro Sula, Hondu-ras
brittish american tobacco	Londres, Reino Unido	TAHSA	San Pedro Sula, Hondu-ras
C.I. Unibán S.A.	Medellín, Colombia	C.I. Unibán S.A.	Medellín, Colombia
central dulcera S.A. de C.V.	san salvador, salvador	central dulcera S.A. de C.V.	san salvador, salvador
central dulcera S.A. de C.V.	san salvador, salvador	central dulcera S.A. de C.V.	san salvador, salvador
central dulcera S.A. de C.V.	san salvador, salvador	central dulcera S.A. de C.V.	san salvador, salvador
central dulcera S.A. de C.V.	san salvador, salvador	central dulcera S.A. de C.V.	san salvador, salvador
central dulcera S.A. de C.V.	san salvador, salvador	central dulcera S.A. de C.V.	san salvador, salvador
central dulcera S.A. de C.V.	san salvador, salvador	central dulcera S.A. de C.V.	san salvador, salvador
Coca Cola Company	Atlanta, U.S.A.	FEMSA	panamá, panamá
Coca Cola Company	Atlanta, U.S.A.	FEMSA	Panamá, panamá
Coca Cola Company	Atlanta, U.S.A.	FEMSA	Panamá, panamá
Coca Cola Company	Atlanta, U.S.A.	FEMSA	panamá, panamá
Coca Cola Company	Atlanta, U.S.A.	FEMSA	Panamá, panamá
Coca Cola Company	Atlanta, U.S.A.	The coca-cola company	Atlanta, U.S.A.
Coca Cola Company	Atlanta, U.S.A.	The coca-cola company	Atlanta, U.S.A.

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Parent Company	Parent Company Location	Manufacturer	Manufacturing Location
Del Monte Foods	San Francisco, CA	Del Monte Foods	San Francisco, Califor-nia, U.S.A.
Docile	Lajeado, Brazil	docile	Lajeado, Brazil
Docile	Lajeado, Brazil	Docile alimetnos LTDA	Lajeado, brasil
Docile	Lajeado, Brazil	Docile alimetnos LTDA	Lajeado, brasil
Dos Pinos	Alajuela. Costa Rica	dos pinos	Alajuela. Costa Rica
Empresa Panameña de Alimentos S.A	Panamá, Panamá	Productos alimenticios pas-cual, S.A.	Panamá, Panamá
Empresa Panameña de Alimentos S.A	Panamá, Panamá	Productos alimenticios pas-cual, S.A.	Panamá, Panamá
Empresa Panameña de Alimentos S.A	Panamá, Panamá	Productos alimenticios pas-cual, S.A.	Panamá, Panamá
Empresa Panameña de Alimentos S.A	Panamá, Panamá	Productos alimenticios pas-cual, S.A.	Panamá, Panamá
Empresa Panameña de Alimentos S.A	Atlanta, U.S.A.	Productos alimenticios pas-cual, S.A.	Panamá, Panamá
Empresa Panameña de Alimentos S.A	Atlanta, U.S.A.	Productos alimenticios pas-cual, S.A.	Panamá, Panamá
Empresa Panameña de Alimentos S.A	Atlanta, U.S.A.	Productos alimenticios pas-cual, S.A.	Panamá, Panamá
Empresa Panameña de Alimentos S.A	Panamá, Panamá	Productos alimenticios pas-cual, S.A.	Panamá, Panamá
Empresa Panameña de Alimentos S.A	Panamá, Panamá	Productos alimenticios pas-cual, S.A.	Panamá, Panamá
Empresa Panameña de Alimentos S.A	Panamá, Panamá	Productos alimenticios pas-cual, S.A.	Panamá, Panamá
Empresa Panameña de Alimentos S.A	Panamá, Panamá	Productos alimenticios pas-cual, S.A.	Panamá, Panamá



Parent Company	Parent Company Location	Manufacturer	Manufacturing Location
Empresa Panameña de Alimentos S.A	Panamá, Panamá	Productos alimenticios pas-cual, S.A.	Panamá, Panamá
Empresa Panameña de Alimentos S.A	Panamá, Panamá	Productos alimenticios pas-cual, S.A.	Panamá, Panamá
Empresa Panameña de Alimentos S.A	Panamá, Panamá	Productos alimenticios pas-cual, S.A.	Panamá, Panamá
Empresa Panameña de Alimentos S.A	Panamá, Panamá	Productos alimenticios pas-cual, S.A.	Panamá, Panamá
Empresa Panameña de Alimentos S.A	Panamá, Panamá	Productos alimenticios pas-cual, S.A.	Panamá, Panamá
Empresa Panameña de Alimentos S.A	Panamá, Panamá	Productos alimenticios pas-cual, S.A.	Panamá, Panamá
Empresa Panameña de Alimentos S.A	Panamá, Panamá	Productos alimenticios pas-cual, S.A.	Panamá, Panamá
Empresa Panameña de Alimentos S.A	Panamá, Panamá	Productos alimenticios pas-cual, S.A.	Panamá, Panamá
Empresa Panameña de Alimentos S.A	Panamá, Panamá	Productos alimenticios pas-cual, S.A.	Panamá, Panamá
Empresa Panameña de Alimentos S.A	Panamá, Panamá	Productos alimenticios pas-cual, S.A.	Panamá, Panamá
Empresa Panameña de Alimentos S.A	Panamá, Panamá	Productos alimenticios pas-cual, S.A.	Panamá, Panamá
Empresa Panameña de Alimentos S.A	Panamá, Panamá	Productos alimenticios pas-cual, S.A.	Panamá, Panamá
Empresa Panameña de Alimentos S.A	Panamá, Panamá	Productos alimenticios pas-cual, S.A.	Panamá, Panamá
Empresa Panameña de Alimentos S.A	Panamá, Panamá	Productos alimenticios pas-cual, S.A.	Panamá, Panamá
Empresa Panameña de Alimentos S.A	Panamá, Panamá	Productos alimenticios pas-cual, S.A.	Panamá, Panamá
Ferrero Group	Alba, Piedmont, Italy	Ferrero del Ecuador S.A.	Quito , Ecuador
Ferrero Group	Alba, Piedmont, Italy	Ferrero Group	Alba, Piedmont, Italy

Parent Company	Parent Company Location	Manufacturer	Manufacturing Location
Ferrero Group	Alba, Piedmont, Italy	Ferrero del Ecuador	Quito Ecuador
Goya Foods	Secaucus, NJ	Goya	Brookshire, TX
Grupo Altria	Richmond, Virginia, U.S.A.	C.A. cigarrera BIGOTT SUCS	Caracas, Venezuela
Grupo Altria	Richmond, Virginia, U.S.A.	C.A. cigarrera BIGOTT SUCS	Caracas, Venezuela
Grupo Altria	Richmond, Virginia, U.S.A.	C.A. cigarrera BIGOTT SUCS	Caracas, Venezuela
Grupo Nutresa S.A	Medellín, Colombia	Grupo Pozuelo & Pro	Ciudad Colón, Costa Rica
Grupo Nutresa S.A	Medellín, Colombia	Grupo Pozuelo & Pro	Ciudad Colón, Costa Rica
Grupo Nutresa S.A	Medellín, Colombia	Grupo Pozuelo & Pro	Ciudad Colón, Costa Rica
Grupo Nutresa S.A	Medellín, Colombia	compañía galletas pozuelo DCR S.A.	San José, Costa Rica
Grupo Nutresa S.A	Medellín, Colombia	Grupo Pozuelo & Pro	Ciudad Colón, Costa Rica
Grupo Nutresa S.A	Medellín, Colombia	COMPAÑÍA NACIONAL DE CHOCOLATES S.A.S.	Medellín, Colombia
Grupo Nutresa S.A	Medellín, Colombia	Grupo Pozuelo & Pro	Ciudad Colón, Costa Rica
Grupo Nutresa S.A	Medellín, Colombia	compañía galletas pozuelo DCR S.A.	San José, Costa Rica
Grupo Nutresa S.A	Medellín, Colombia	Grupo Pozuelo & Pro	Ciudad Colón, Costa Rica
Grupo Nutresa S.A	Medellín, Colombia	compañía nacional de chocolates S.A.S.	Antioquía, Colombia
Guatemalan Candies S.A.	Guatemala, Guatemala	Guatemalan Candies S.A.	Guatemala, Guatemala
Jacks's	San Jose, Costa Rica	Jacks's	Pavas, Costa Rica

Parent Company	Parent Company Location	Manufacturer	Manufacturing Location
Jacks's	San Jose, Costa Rica	Jacks's	Pavas, Costa Rica
Jacks's	San Jose, Costa Rica	Jacks's	Pavas, Costa Rica
Jacks's	San Jose, Costa Rica	Jacks's	Pavas, Costa Rica
Jacks's	San Jose, Costa Rica	Jacks's	Pavas, Costa Rica
Jacks's	San Jose, Costa Rica	Jacks's	Pavas, Costa Rica
Jacks's	San Jose, Costa Rica	Jacks's	Pavas, Costa Rica
Jacks's	San Jose, Costa Rica	Jacks's	Pavas, Costa Rica
Jacks's	San Jose, Costa Rica	Jacks's	Pavas, Costa Rica
Jacks's	San Jose, Costa Rica	Jacks's	Pavas, Costa Rica
Jacks's	San Jose, Costa Rica	Jacks's	Pavas, Costa Rica
Jacks's	San Jose, Costa Rica	Jacks's	Pavas, Costa Rica
La Italiana	Panamá, Panamá	helados la italiana S.A.	Panamá, Panamá
La Italiana	Panamá, Panamá	helados la italiana S.A.	Panamá, Panamá
La Italiana	Panamá, Panamá	helados la italiana S.A.	Panamá, Panamá
La Italiana	Panamá, Panamá	helados la italiana S.A.	Panamá, Panamá
Las Delicias	Santa Ana Tepetitlán, Zapo-pan, Jalisco, México	las delicias	Santa Ana Tepetitlán, México
Manitoba	Bogotá, Colombia	MANITOBA LIMITADA	Cali, Colombia
Mars Inc	Atlanta, U.S.A.	Mars Inc	McLean, Virginia, U.S.A.

Parent Company	Parent Company Location	Manufacturer	Manufacturing Location
Mars Inc	Atlanta, U.S.A.	Mars Inc	Mclean, Virginia, U.S.A.
Mars Inc	Atlanta, U.S.A.	Mars Inc	Mclean, Virginia, U.S.A.
Mars Inc	Mclean, Virginia, U.S.A.	Mars Inc	Mclean, Virginia, U.S.A.
Mars Inc	Mclean, Virginia, U.S.A.	Mars Inc	Mclean, Virginia, U.S.A.
Mars Inc	Mclean, Virginia, U.S.A.	Mars Inc	Mclean, Virginia, U.S.A.
Mars Inc	Mclean, Virginia, U.S.A.	Mars Inc	Mclean, Virginia, U.S.A.
Mars Inc	Mclean, Virginia, U.S.A.	Mars Inc	Mclean, Virginia, U.S.A.
Mars Inc	Mclean, Virginia, U.S.A.	Mars Inc	Mclean, Virginia, U.S.A.
Mars Inc	Mclean, Virginia, U.S.A.	Mars Inc	Mclean, Virginia, U.S.A.
Mars Inc	Mclean, Virginia, U.S.A.	Mars Inc	Mclean, Virginia, U.S.A.
Mars Inc	Mclean, Virginia, U.S.A.	Mars Inc	Mclean, Virginia, U.S.A.
Mars Inc	Mclean, Virginia, U.S.A.	Mars Inc	Mclean, Virginia, U.S.A.
Mars Inc	Mclean, Virginia, U.S.A.	Mars Inc	Mclean, Virginia, U.S.A.
Mars Inc	Mclean, Virginia, U.S.A.	Mars Inc	Mclean, Virginia, U.S.A.
Mars Inc	Mclean, Virginia, U.S.A.	Mars Inc	Mclean, Virginia, U.S.A.
Mondelez International, Inc	Chicago, Illinois, U.S.	Mondelez México, S de R.L. de C.V.	CDMX, México
Mondelez International, Inc	Chicago, Illinois, U.S.	Mondelez México, S de R.L. de C.V.	CDMX, México
Mondelez International, Inc	Chicago, Illinois, U.S.	Mondelez México, S de R.L. de C.V.	CDMX, México
Mondelez International, Inc	Chicago, Illinois, U.S.	Mondelez México, S de R.L. de C.V.	CDMX, México

Parent Company	Parent Company Location	Manufacturer	Manufacturing Location
Mondelez International, Inc	Chicago, Illinois, U.S.	Mondelez México, S de R.L. de C.V.	CDMX, México
Mondelez International, Inc	Chicago, Illinois, U.S.	Mondelez México, S de R.L. de C.V.	CDMX, México
Mondelez International, Inc	Chicago, Illinois, U.S.	Mondelez México, S de R.L. de C.V.	CDMX, México
Mondelez International, Inc	Chicago, Illinois, U.S.	Mondelez México, S de R.L. de C.V.	CDMX, México
Mondelez International, Inc	Chicago, Illinois, U.S.	Mondelez México, S de R.L. de C.V.	CDMX, México
Mondelez International, Inc	Chicago, Illinois, U.S.	Mondelez México, S de R.L. de C.V.	CDMX, México
Mondelez International, Inc	Chicago, Illinois, U.S.	Mondelez México, S de R.L. de C.V.	CDMX, México
Mondelez International, Inc	Chicago, Illinois, U.S.	Mondelez México, S de R.L. de C.V.	CDMX, México
Mondelez International, Inc	Chicago, Illinois, U.S.	Mondelez México, S de R.L. de C.V.	CDMX, México
Mondelez International, Inc	Chicago, Illinois, U.S.	Mondelez México, S de R.L. de C.V.	CDMX, México
Mondelez International, Inc	Chicago, Illinois, U.S.	Mondelez México, S de R.L. de C.V.	CDMX, México
Mondelez International, Inc	Chicago, Illinois, U.S.	Mondelez México, S de R.L. de C.V.	CDMX, México
Mondelez International, Inc	Chicago, Illinois, U.S.	Mondelez México, S de R.L. de C.V.	CDMX, México
Mondelez International, Inc	Chicago, Illinois, U.S.	Mondelez México, S de R.L. de C.V.	CDMX, México
Mondelez International, Inc	Chicago, Illinois, U.S.	Mondelez México, S de R.L. de C.V.	CDMX, México
Mondelez International, Inc	Chicago, Illinois, U.S.	Mondelez México, S de R.L. de C.V.	CDMX, México
Mondelez International, Inc	Chicago, Illinois, U.S.	Mondelez Perú	Lima, Perú
Mondelez International, Inc	Chicago, Illinois, U.S.	Mondelez Perú	Lima, Perú
Mondelez International, Inc	Chicago, Illinois, U.S.	mondelez México, S de R.L. de C.V.	CDMX, México

[illegible]



Parent Company	Parent Company Location	Manufacturer	Manufacturing Location
Panama Dairy Ventures Ltd	Panamá, Panamá	Industrias lacteas s.a.	Panamá, Panamá
Panama Dairy Ventures Ltd	Panamá, Panamá	Industrias lacteas s.a.	Panamá, Panamá
Panama Dairy Ventures Ltd	Panamá, Panamá	Industrias lacteas s.a.	Panamá, Panamá
Panama Dairy Ventures Ltd	Panamá, Panamá	Industrias lacteas s.a.	Panamá, Panamá
Panama Dairy Ventures Ltd	Panamá, Panamá	Industrias lacteas s.a.	Panamá, Panamá
Panama Dairy Ventures Ltd	Panamá, Panamá	Industrias lacteas s.a.	Panamá, Panamá
Panama Dairy Ventures Ltd	Panamá, Panamá	Industrias lacteas s.a.	Panamá, Panamá
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	embotelladora la mariposa	guatemala, guatemala

Parent Company	Parent Company Location	Manufacturer	Manufacturing Location
Pepsico	Purchase, NY	la florida s.a.	heredia, costa rica
Pepsico	Purchase, NY	productos alimenticios rené y cía, s.c.a.	Guatemala, Guatemala
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	la florida s.a.	heredia, costa rica
Pepsico	Purchase, NY	productos alimenticios rené y cía, s.c.a.	Guatemala, Guatemala
Pepsico	Purchase, NY	productos alimenticios rené y cía, s.c.a.	Guatemala, Guatemala
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	productos alimenticios rené y cía, s.c.a.	Guatemala, Guatemala
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	productos alimenticios rené y cía, s.c.a.	Guatemala, Guatemala
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	la florida s.a.	heredia, costa rica
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	productos alimenticios rené y cía, s.c.a.	Guatemala, Guatemala
Pepsico	Purchase, NY	la florida s.a.	heredia, costa rica
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.

Parent Company	Parent Company Location	Manufacturer	Manufacturing Location
Pepsico	Purchase, NY	productos alimenticios rené y cía, s.c.a.	Guatemala, Guatemala
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	productos alimenticios rené y cía, s.c.a.	Guatemala, Guatemala
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	la florida s.a.	heredia, costa rica
Pepsico	Purchase, NY	productos alimenticios rené y cía, s.c.a.	Guatemala, Guatemala
Pepsico	Purchase, NY	la florida s.a.	heredia, costa rica
Pepsico	Purchase, NY	la florida s.a.	heredia, costa rica
Pepsico	Purchase, NY	productos alimenticios rené y cía, s.c.a.	Guatemala, Guatemala
Pepsico	Purchase, NY	productos alimenticios rené y cía, s.c.a.	Guatemala, Guatemala

Parent Company	Parent Company Location	Manufacturer	Manufacturing Location
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	la florida s.a.	heredia, costa rica
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	la florida s.a.	heredia, costa rica
Pepsico	Purchase, NY	Quaker Oats Company	Mexico City, Mexico
Pepsico	Purchase, NY	pepsico méxico, s. de R.L.	CDMX, México
Pepsico	Purchase, NY	productos alimenticios rené y cía, s.c.a.	Guatemala, Guatemala
Pepsico	Purchase, NY	productos alimenticios rené y cía, s.c.a.	Guatemala, Guatemala
Pepsico	Purchase, NY	productos alimenticios rené y cía, s.c.a.	Guatemala, Guatemala
Pepsico	Purchase, NY	comercializadora Pepsico México	Mexico City, Mexico
Pepsico	Purchase, NY	productos alimenticios rené y cía, s.c.a.	Guatemala, Guatemala
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	productos alimenticios rené y cía, s.c.a.	Guatemala, Guatemala
Pepsico	Purchase, NY	productos alimenticios rené y cía, s.c.a.	Guatemala, Guatemala

Parent Company	Parent Company Location	Manufacturer	Manufacturing Location
Pepsico	Purchase, NY	Corazón LL	Panamá, Panamá
Pepsico	Purchase, NY	la florida s.a.	heredia, costa rica
Pepsico	Purchase, NY	embotelladora la mariposa	guatemala, guatemala
Pepsico	Purchase, NY	comercializadora Pepsico México	Mexico City, Mexico
Pepsico	Purchase, NY	productos alimenticios rené y cía, s.c.a.	Guatemala, Guatemala
Pepsico	Purchase, NY	pepsico méxico, s. de R.L.	CDMX, México
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	Frito-Lay	Plano, Texas, U.S.A.
Pepsico	Purchase, NY	productos alimenticios rené y cía, s.c.a.	Guatemala, Guatemala
Pepsico	Purchase, NY	comercializadora Pepsico México	Mexico City, Mexico
Pepsico	Purchase, NY	productos alimenticios rené y cía, s.c.a.	Guatemala, Guatemala
Pepsico	Purchase, NY	productos alimenticios rené y cía, s.c.a.	Guatemala, Guatemala
Pepsico	Purchase, NY	pepsico méxico, s. de R.L.	CDMX, México
Pepsico	Purchase, NY	comercializadora Pepsico México	Mexico City, Mexico
Pepsico	Purchase, NY	pepsico méxico, s. de R.L.	CDMX, México
Pepsico	Purchase, NY	productos alimenticios rené y cía, s.c.a.	Guatemala, Guatemala
Pepsico	Purchase, NY	comercializadora Pepsico México	Mexico City, Mexico

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Parent Company	Parent Company Location	Manufacturer	Manufacturing Location
Philip Morris Interna-tional	Richmond, Virginia, U.S.A.	PMMPs, S De R.L. De C.V.	Zapopan, México
Philip Morris Interna-tional	Richmond, Virginia, U.S.A.	PMMPs, S De R.L. De C.V.	Zapopan, México
Philip Morris Interna-tional	Richmond, Virginia, U.S.A.	PMMPs, S De R.L. De C.V.	Zapopan, México
Philip Morris Interna-tional	Richmond, Virginia, U.S.A.	PMMPs, S De R.L. De C.V.	Zapopan, México
Philip Morris Interna-tional	Richmond, Virginia, U.S.A.	PMMPs, S De R.L. De C.V.	Zapopan, México
Philip Morris Interna-tional	Richmond, Virginia, U.S.A.	PMMPs, S De R.L. De C.V.	Zapopan, México
Philip Morris Interna-tional	Richmond, Virginia, U.S.A.	PMMPs, S De R.L. De C.V.	Zapopan, México
Philip Morris Interna-tional	Richmond, Virginia, U.S.A.	PMMPs, S De R.L. De C.V.	Zapopan, México
Philip Morris Interna-tional	Richmond, Virginia, U.S.A.	PMMPs, S De R.L. De C.V.	Zapopan, México
Philip Morris Interna-tional	Richmond, Virginia, U.S.A.	PMMPs, S De R.L. De C.V.	Zapopan, México
Philip Morris Interna-tional	Richmond, Virginia, U.S.A.	PMMPs, S De R.L. De C.V.	Zapopan, México
Philip Morris Interna-tional	Richmond, Virginia, U.S.A.	PMMPs, S De R.L. De C.V.	Zapopan, México
Philip Morris Interna-tional	Richmond, Virginia, U.S.A.	PMMPs, S De R.L. De C.V.	Zapopan, México
Philip Morris Interna-tional	Richmond, Virginia, U.S.A.	PMMPs, S De R.L. De C.V.	Zapopan, México
Philip Morris Interna-tional	Richmond, Virginia, U.S.A.	PMMPs, S De R.L. De C.V.	Zapopan, México
Philip Morris Interna-tional	Richmond, Virginia, U.S.A.	PMMPs, S De R.L. De C.V.	Zapopan, México
Philip Morris Interna-tional	Richmond, Virginia, U.S.A.	PMMPs, S De R.L. De C.V.	Zapopan, México
Philip Morris Interna-tional	Richmond, Virginia, U.S.A.	PMMPs, S De R.L. De C.V.	Zapopan, México
Philip Morris Interna-tional	Richmond, Virginia, U.S.A.	PMMPs, S De R.L. De C.V.	Zapopan, México
Productos Nevada	Chiriquí, Panamá	productos nevada	Chiriquí, Panamá
productos nuevo jimmy	Panamá, Panamá	productos nuevo jimmy	Panamá, Panamá

Parent Company	Parent Company Location	Manufacturer	Manufacturing Location
Productos Yupi S.A.S.	Bogotá, Colombia	compañía internacional de alimenticios S.A.S.	Bogotá, Colombia
Productos Yupi S.A.S.	Bogotá, Colombia	compañía internacional de alimenticios S.A.S.	Bogotá, Colombia
Productos Yupi S.A.S.	Bogotá, Colombia	compañía internacional de alimenticios S.A.S.	Bogotá, Colombia
Productos Yupi S.A.S.	Bogotá, Colombia	compañía internacional de alimenticios S.A.S.	Bogotá, Colombia
Productos Yupi S.A.S.	Bogotá, Colombia	compañía internacional de alimenticios S.A.S.	Bogotá, Colombia
Productos Yupi S.A.S.	Bogotá, Colombia	compañía internacional de alimenticios S.A.S.	Bogotá, Colombia
Productos Yupi S.A.S.	Bogotá, Colombia	compañía internacional de alimenticios S.A.S.	cauca, colombia
Productos Yupi S.A.S.	Bogotá, Colombia	compañía internacional de alimenticios S.A.S.	Bogotá, Colombia
Productos Yupi S.A.S.	Bogotá, Colombia	compañía internacional de alimenticios S.A.S.	cauca, colombia
Productos Yupi S.A.S.	Bogotá, Colombia	compañía internacional de alimenticios S.A.S.	Bogotá, Colombia
Productos Yupi S.A.S.	Bogotá, Colombia	compañía internacional de alimenticios S.A.S.	Bogotá, Colombia
Productos Yupi S.A.S.	Bogotá, Colombia	compañía internacional de alimenticios S.A.S.	Bogotá, Colombia
Productos Yupi S.A.S.	Bogotá, Colombia	compañía internacional de alimenticios S.A.S.	Bogotá, Colombia
Productos Yupi S.A.S.	Bogotá, Colombia	compañía internacional de alimenticios S.A.S.	cauca, colombia
Productos Yupi S.A.S.	Bogotá, Colombia	compañía internacional de alimenticios S.A.S.	Bogotá, Colombia
Productos Yupi S.A.S.	Bogotá, Colombia	compañía internacional de alimenticios S.A.S.	Bogotá, Colombia
Productos Yupi S.A.S.	Bogotá, Colombia	compañía internacional de alimenticios S.A.S.	Bogotá, Colombia

Parent Company	Parent Company Location	Manufacturer	Manufacturing Location
Productos Yupi S.A.S.	Bogotá, Colombia	compañía internacional de alimenticios S.A.S.	cauca, colombia
Ricola Ltd.	Laufen , Switzerland	Ricola Ltd.	Laufen , Switzerland
sociedad de alimentos de primera S.A.	Panamá, Panamá	sociedad de alimentos de primera S.A.	Panamá, Panamá
sociedad de alimentos de primera S.A.	Panamá, Panamá	sociedad de alimentos de primera S.A.	Panamá, Panamá
sociedad de alimentos de primera S.A.	Panamá, Panamá	sociedad de alimentos de primera S.A.	Panamá, Panamá
super de alimentos S.A.S.	Manizales, Colombia	super de alimentos S.A.S.	Manizales, Colombia
super de alimentos S.A.S.	Manizales, Colombia	super de alimentos S.A.S.	Manizales, Colombia
The Hershey Company	Hershey, Pensilvania, Estados Unidos	The Hershey Company	Hershey, Pensilvania, Estados Unidos
The Hershey Company	Hershey, Pensilvania, Estados Unidos	The Hershey Company	Hershey, Pensilvania, Estados Unidos
The Hershey Company	Hershey, Pensilvania, Estados Unidos	The Hershey Company	Hershey, Pensilvania, Estados Unidos
the kellog's company	Battle Creek, Míchigan, Esta-dos Unidos	Pringle	Jackson, Tennessee
the kellog's company	Battle Creek, Míchigan, Esta-dos Unidos	Pringle	Jackson, Tennessee
the kellog's company	Battle Creek, Míchigan, Esta-dos Unidos	Pringle	Jackson, Tennessee
Trolli GmbH	Furth, Germany	trolli ibérica S.A.	valencia, España
Trolli GmbH	Furth, Germany	trolli ibérica S.A.	valencia, España
Trolli GmbH	Furth, Germany	trolli ibérica S.A.	valencia, España

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