Santa Fe, Argentina

City Waste Management Profile

URBAN OCEAN

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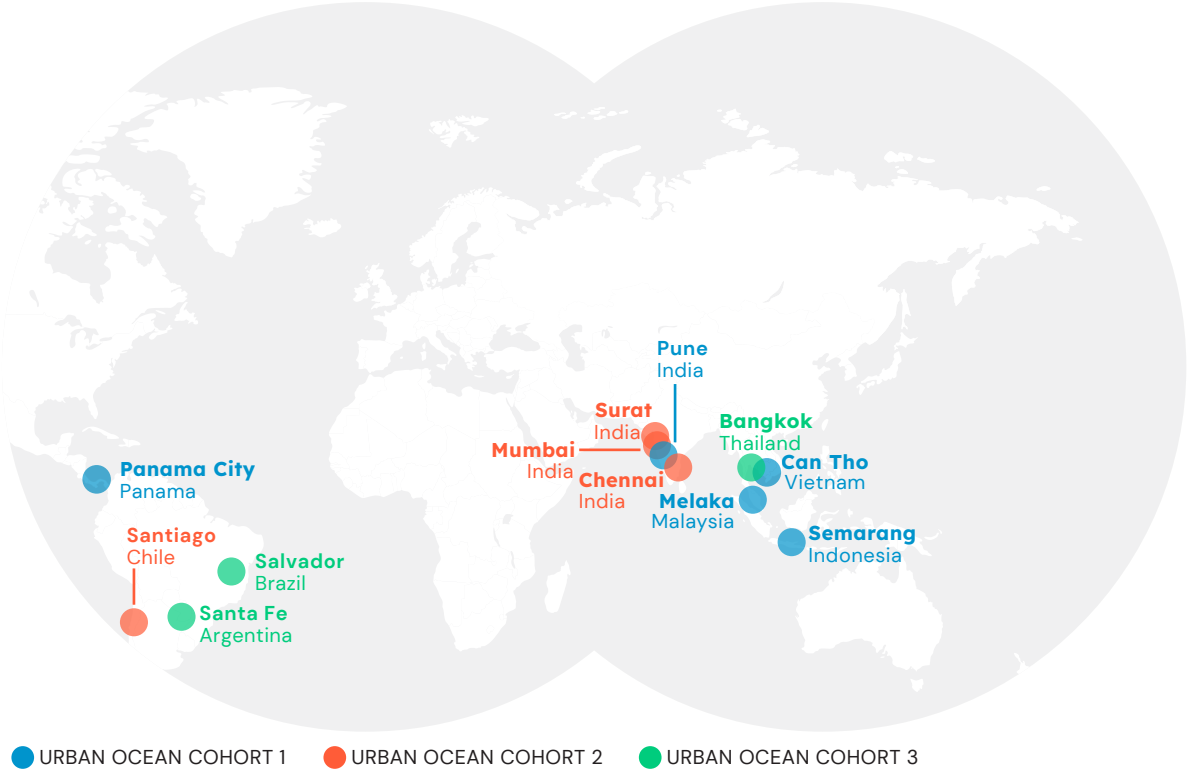
1. Introduction to Urban Ocean

Urban Ocean is a capacity-building and accelerator program for cities that champions circular economy principles, builds awareness of ocean plastic pollution, and assesses waste management systems. The program works with city leaders to bring new ideas, partners, and resources together to solve interrelated resilience challenges associated with waste management, reducing plastic leakage, and protecting water bodies. It demonstrates how actions to improve waste management and recycling can provide resilient and sustainable solutions that reduce ocean plastic pollution while addressing key city priorities such as improving public health, supporting economic development, and reducing greenhouse gas emissions. Furthermore, Urban Ocean provides cities with the opportunity to showcase leadership and share knowledge and experience across the Resilient Cities Network community and beyond.

The program is jointly led by R-Cities, Ocean Conservancy and The Circulate Initiative, in partnership with the City of Santa Fe and Universidad Nacional del Litoral.

FIGURE 1
Urban Ocean cities map



Overview of the Urban Ocean Challenge

Cities are home to over half of the global population and account for nearly three quarters of greenhouse gas emissions. Neither climate nor social targets will be met without a deep transformation of urban centers towards a more inclusive, sustainable and, ultimately, resilient path. Approaching urban waste management systems through a resilience lens reveals complex, interrelated ramifications for social, economic and environmental systems. The International Labor Organization estimates that the waste management sector alone has the potential to create 45 million jobs globally by 2030 while reducing greenhouse gas emissions by 15 to 20 percent. Additionally, within the same time frame, circular economies offer a $4.5 trillion USD economic opportunity by reducing waste, stimulating innovation, and creating employment (World Resources Institute, 2021). Currently, plastic usage continues to grow, remaining a threat to public and environmental health in the ocean and in cities. City governments have a unique opportunity to implement policies and projects that promote a more resilient and circular waste sector in their cities. Now is the time to set out on the path towards a more resilient urban–ocean relationship that highlights the importance of preventing marine plastic debris.

Urban Ocean Cities

Urban Ocean works closely with cities to demonstrate tangible solutions and highlight progress in addressing waste management challenges. The first cohort of Urban Ocean cities, launched in 2020, included Pune (India), Can Tho (Vietnam), Panama City (Panama), Semarang (Indonesia) and Melaka (Malaysia). In 2022, the program expanded to four additional cities in Cohort 2 – Chennai, Surat, and Mumbai (all in India) and Santiago (Chile), and then in 2023 to Cohort 3 – Salvador (Brazil), Bangkok (Thailand), and Santa Fe (Argentina). This expansion aimed to broaden the program's geographic scope, strengthen waste management, circular economy, and resilience ecosystems, increase collaboration with local governments, and establish effective waste-management systems that generate environmental, social and economic co-benefits for cities.

Program Objective

Urban Ocean provides a platform for ocean advocates, city leaders and allies to join forces with other collaborators in developing comprehensive solutions that meet the needs and priorities of cities and their communities, creating meaningful and sustainable impact. The program provides and coordinates baseline assessments to gauge the efficacy, challenges and opportunities of existing waste management systems. Urban Ocean sparks critical conversations that help participating cities identify, develop and implement solutions to improve waste management and reduce plastic pollution through circular and resilient lenses that also promote social inclusion, public health, environmental protection and reductions in greenhouse gas emissions. Once opportunities are identified, Urban Ocean supports cities to attract support to implement solutions.

Program Approach

Urban Ocean provides support for cities to develop strategies and projects designed to address the interrelated challenges of ocean plastics and community resilience. The program approach in cities is shown in figure 2.

Methodology

This report provides a summary of the information collected to develop a resilience-oriented analysis of the urban waste management system in Santa Fe, Argentina. The analysis involved desk research, interviews and collaborative workshops with city stakeholders.

FIGURE 2

Urban Ocean Program Approach

Preparation Forum

- Sessions related to Resilience, Plastic Policy, Science-based solutions, Finance and Circularity Incubators
- Innovation Dialogues with the private sector

Gap Assessment

- Circularity Assessment Protocol (CAP)
- Framing Session
- Participatory Session
- Solutioning Tool
- OPPORTUNITY ASSESSMENT

Project Design

- Project proposal development
- Pilot Implementation

2. About the City Waste Management Profile

As part of Urban Ocean, cities create a City Waste Management Profile, in which a city's waste management systems are presented, including technical and sustainability aspects, and formal and informal actors in the system. The City Waste Management Profile examines major disturbances and stresses that impact the city's waste management system. It brings together existing data and information collected in the initial phases of the program to allow the city to assess the risks and vulnerabilities of the system, as well as support project design

Developing such a profile provides insight for the city to better plan and identify appropriate solutions to increase the resilience of its waste management system, reduce plastic leakage into the environment and improve the city's ability to respond to, adapt to or otherwise address current and future shocks and stresses. It summarizes the baseline assessment conducted in all cities in the Urban Ocean program and highlights the most relevant data and information to address urban resilience, ocean conservation and plastic pollution.

City Waste Management Profiles encourage a more holistic approach to existing challenges and support cities in the development of solutions suited to their specific history, economy, demographics and culture while being aligned with the city's unique institutional, environmental and financial resources. An added benefit of participating in Urban Ocean is that cities can learn from each other by comparing common elements in their respective profiles.

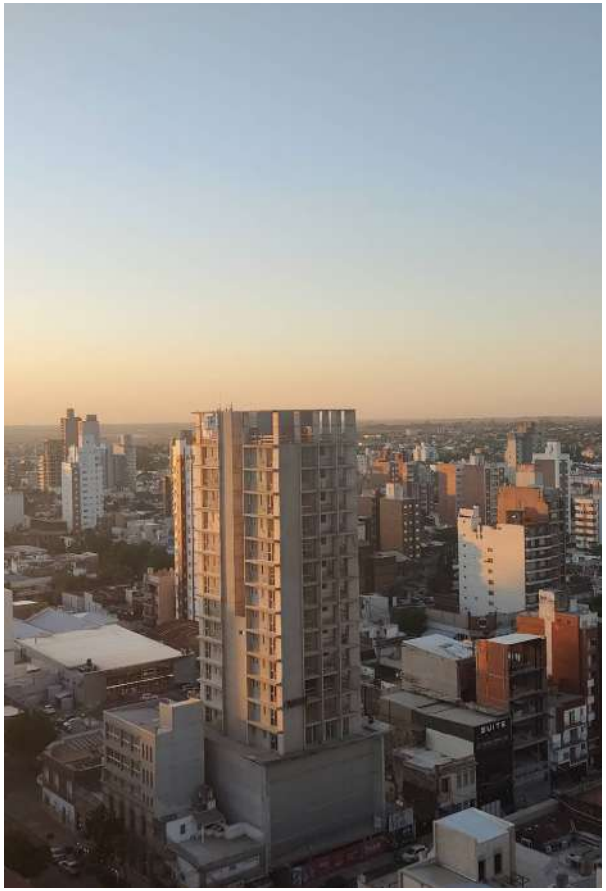


TABLE 1
Interviewed stakeholders

Government

Municipalidad de la Ciudad de Santa Fe (MCSF)

Undersecretariat of the Circular Economy and Waste Management pf the Province of Santa Fe

Cleaning Supervisor, Plaza Puyreddon

Waste Management Sector

Barrenderos Cliba

Informal waste collectors

Cliba manager

Milicic

Recyclable waste buyers

Non-governmental organizations (NGOs)

Asociación Parque Federal

CeProNat

Movimiento Evita

Sociedad Rural Las Colonias

Asociación Dignidad y Vida Sana

Industry

Efiplast (Manufacturer of garbage bags and printed polythene and polypropylene bags. Paper mill producing disposable packaging.)

CCU Cervecería Santa Fe

Grumo (recycled plastic pellets)

Itza (environmental consultant)

Chopy (snacks)

Academia

Faculty of Water Engineering and Sciences

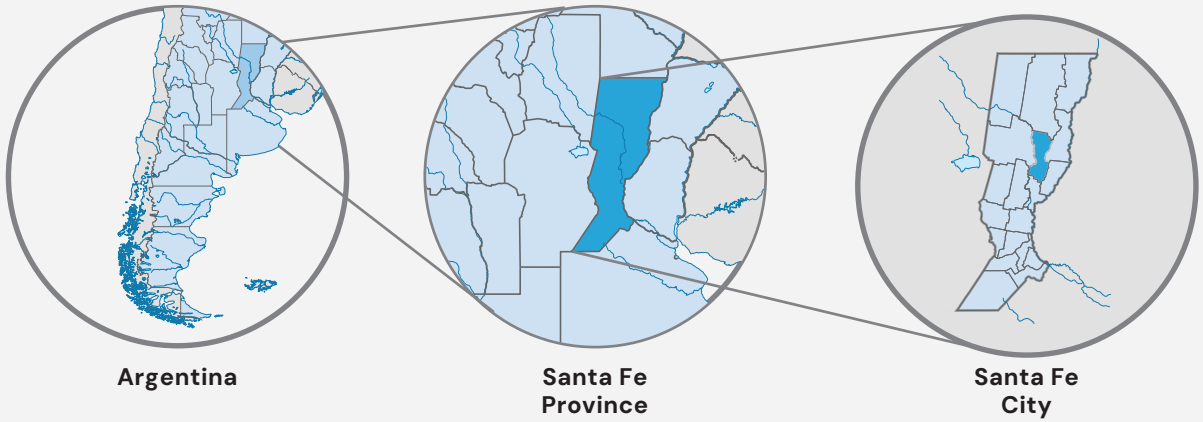
Universidad Nacional del Litoral

Universidad Técnica Nacional

3. Overview of Santa Fe and its Resilience Journey

The city of Santa Fe is the capital of the Argentine province of the same name and is located in the central-eastern part of the country (Figure 3), near the confluence of the Salado and Paraná rivers. It is the oldest port city in Argentina and the first settlement on the Río de la Plata. Figure 3 shows a selection of sociodemographic data from the city.

FIGURE 3
Socio-demographic indicators of Santa Fe



403,878
Inhabitants

8,040 hectares
Urban area

26,800 hectares
Total area of the city (70% consisting of rivers, lagoons and wetlands.)

1,614 inhab./km²
Population density (Considering the inhabitable area, the density increases to 5,410 inhab./km2.)

33,669 inhabitants
Population in informal housing (Population with unmet basic needs[1])

Source: INDEC (2022), MCSF (2023a), IPEC (2024).

1 According to INDEC survey methodology, households with unmet basic needs are defined as having at least one of the following characteristics:

- unsuitable housing: dwellings that are precarious or unfit for occupation;
- inadequate sanitary conditions: households without toilets;
- overcrowding: more than three people per room;
- no schooling: children of school age (6 to 12 years) who do not attend school;
- subsistence capacity: households with more than four persons per working member, and heads of household who have not completed primary education. (DINREP, 2014)

The City's Relationship with its Rivers, Lakes and the Ocean

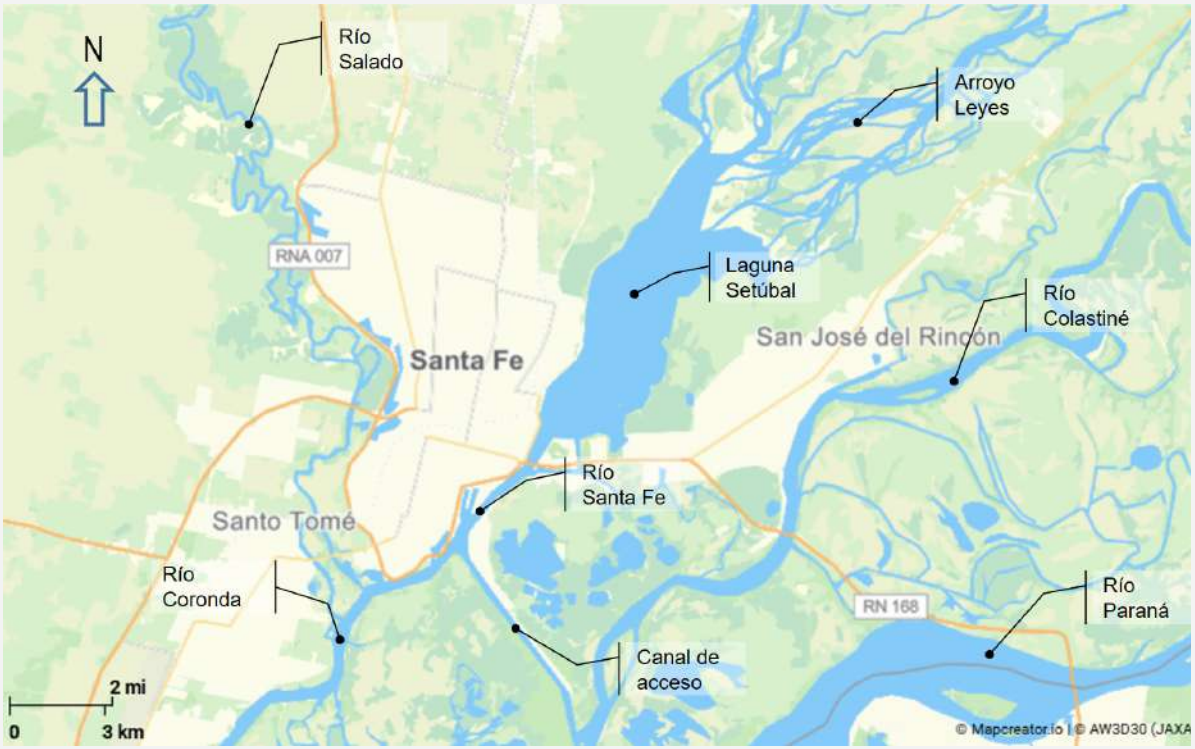
The city of Santa Fe is located in an area that is surrounded by water, with more than 70 percent of its territory made up of rivers, lagoons, and wetlands. The city is bordered to the east by the Setúbal lagoon; to the west by the Salado river; and to the south by the Santa Fe stream, which eventually merges with the Paraná river (Figure 4). The city lies within the central Paraná river basin, the main tributary of the Río de la Plata, which flows into the Atlantic Ocean.

These rivers and lagoons not only define Santa Fe's boundaries but are also essential to life in the city by regulating the ecosystem, contributing to biodiversity, providing fresh water and enabling economic activity including fishing and tourism. They also help drain excess water and reduce the risk of flooding. However, the location of Santa Fe and its natural surroundings pose major challenges, as the city can suffer from flooding during heavy rains or when river levels rise, hindering its growth and development.

Climate change, unplanned urban growth, poor drainage infrastructure and inadequate waste management are some of the factors exacerbating this flood risk. In particular, the city invests a significant percentage of its budget each year to unblock pipes and to open drains, as increasingly intense and frequent climate events cause plastic and other waste materials to accumulate around storm drains, hindering proper water management.

FIGURE 4

Map showing the city of Santa Fe's geographical location in the Litoral de Argentina region, on the shores of the Setúbal lagoon and near the confluence of the Salado and Paraná rivers.



Source: Created by the authors using https://mghydro.com/watersheds.

Key Shocks and Stresses Affecting Waste Management Systems in the City

During the development of the city of the Resilience Strategy (MCSF, 2017), the city identified shocks (isolated events) and stresses (phenomena that put pressure on or weaken the urban fabric on a daily or cyclical basis) that are directly or indirectly related to local waste management. These include:

HYDROMETEOROLOGICAL SHOCKS:

Santa Fe's urban growth has increased vulnerability to hydrometeorological phenomena that are becoming more frequent and intense as a result of climate change. The city relies on complex and expensive flood protection systems that require regular maintenance to ensure their continued effectiveness in the event of river overflow and during heavy rains. Poor waste management, particularly waste leakage, causes problems due to clogged drainage systems that worsen risks.

ECONOMIC AND SOCIAL STRESSES:

Sharply contrasting conditions in the city's different areas, with neighborhoods in the north and west containing much more homes with unmet basic needs than those in downtown areas and more established residential zones. Some homes are outside the flood protection systems. Meanwhile, endemic crime and violence are critical stressors in the city, with a homicide rate above the national average.

Micro-landfills, the presence of informal waste collectors, and violence all hinder the consolidation of a sense of community and ownership of the immediate surroundings, leading to poor waste management overall.

PHYSICAL STRESSES:

These are related to the lack of access to infrastructure and services in the city's most vulnerable neighborhoods and are due to infrastructure obsolescence and low levels of redundancy. For example, the high proportion of unpaved roads, especially in the west and north of the city, hampers the operation of waste collection services.

Building Resilience through Waste Management

Santa Fe residents value green spaces and natural resources, especially the Santa Fe River, which is a fundamental aspect of the local cultural identity. However, this respect for nature is not always reflected in everyday practices. Despite the beauty and importance of these resources, poor waste management remains a major challenge for the city (UNL, 2024). The lack of waste separation in many households, the indiscriminate dumping of waste in public spaces, and trash accumulating in places not equipped to receive it are recurring problems that affect the quality of the city's environment.

In 2023, more than 300 Santa Fe residents took part in three round-table workshops. During these roundtables, numerous environmental challenges related to waste management and pollution were identified as follows:

- **Rivers and lagoons suffer from the effects of dumping**, which causes pollution of various kinds, including from the pesticides used in agricultural and urban areas, which affect both the water and the soil.
- **The accumulation of waste** in inadequate, illegal dumpsites on streets and beaches, as well as in parks and squares, is a recurring problem, despite the availability of waste disposal containers.
- Residents also emphasized the **persistent inequality between different neighborhoods**: some sectors have scheduled collection services and well-maintained public spaces, while others suffer from impassable streets, piles of garbage, an absence of street lighting and security, and a lack of awareness about looking after public spaces.

The municipal government's Eco Puntos program to promote recycling is certainly considered a welcome initiative, but more efforts are needed to increase its coverage and to raise environmental awareness among citizens to ensure its effectiveness.

4. Legal, Policy and Governance

Governance Structure

In terms of environmental governance, the municipality of the city of Santa Fe is responsible for the management of waste generated within its boundaries, in accordance with National Law no. 25.916, which establishes the country's minimum environmental budgets for the management of household waste. At the local level, the Honorable Municipal Council (HMC), the city's legislative body, plays a leading role by approving ordinances, resolutions and other regulatory instruments directly related to local waste management.

At the metropolitan level, Greater Santa Fe's municipalities and communes have their own strategies and regulations linked to the handling of waste in their respective jurisdictions, although it should be noted that there is only one final disposal site, the Complejo Ambiental de Santa Fe. This situation creates the need to establish environmental-governance frameworks at the metropolitan level by agreeing criteria for service provision and coordinating actions to reduce waste generation, increase collection efficiency and maximize recycling.

With respect to the responsibilities of other levels of government, the Province of Santa Fe – through its Ministry of Environment and Climate Change – is responsible for the implementation of various regulations linked to the final disposal of waste, the handling of hazardous materials and the development of environmental impact studies, among other things.

There are many other stakeholders involved in the governance of local waste management with various roles and influences. These include:

Local and external state stakeholders:

- Executive Municipal Department of the city of Santa Fe;
- Honorable Municipal Council;
- Greater Santa Fe Metropolitan Coordinating Bureau;
- Municipalities and communes of the metropolitan area;
- Provincial Ministry of Environment and Climate Change (provincial agency linked to waste management)
- Secretariat of the Environment of the Nation (national agency linked to waste management)

Licensed urban sanitation service providers:

- Cliba and Urbafe: household waste collection services; street sweeping (manual and mechanical);
- Milicic: landfill operation service provider (Complejo Ambiental).

Other companies or organizations involved at different stages of waste management:

- Asociación Civil Dignidad y Vida Sana: cooperative operating the waste sorting plant at the (Santa Fe and Metropolitan Area Waste Management Facility);
- Cooperatives linked to waste collection and recycling: Cooperativa Reciclando Nuestros Sueños and two other cooperatives not yet officially registered;
- Operators of waste requiring special management;
- Generators of waste requiring special management;
- Mercado de Productores y Abastecedores de Frutas, Verduras y Hortalizas (Fruit and Vegetable Market Producers and Suppliers).

Educational, scientific, and technological sector:

- Universities;
- Research institutes;
- Litoral Centro Technological Park;
- Training institutes.

Civil society stakeholders and waste generators:

- Private and commercial sector;
- Residents;
- Neighborhood associations;
- Chambers of commerce and business entities (sectoral);
- NGOs and environmental foundations.

Media:

- Radio stations: LT10 Radio Universidad, Aire de Santa Fe;
- Television channels: Litus TV (UNL channel), Telefe Santa Fe;
- Newspapers: *El Paraninfo* (UNL), *Diario El Litoral*;
- News portals: UNL, Santa Fe Municipality, *Diario El Litoral* websites;

National and Local Regulations and Guidelines

Table 2 shows the most important national, provincial and local regulatory frameworks connected to the management of solid urban waste in Santa Fe.

TABLE 2
Regulatory framework in the city of Santa Fe

SCOPE	REGULATION	DESCRIPTION
NATIONAL	Law no. 25.916/04 – Household Waste Management	Defined minimum environmental protection budgets for integrated household-waste management, delegating responsibility for their administration to local governments.
PROVINCIAL	Ministry of the Environment and Sustainable Development Resolution 128/04	Established technical regulations for the treatment and final disposal of municipal solid waste (MSW) in the Province of Santa Fe.
PROVINCIAL	Law no. 13.055/09 – Zero Waste	Formalized the adoption of the zero-waste principle to progressively reduce the final disposal of MSW, with specific deadlines and targets, through measures designed to reduce waste generation and promote selective waste separation, recovery, and recycling.
MUNICIPAL	HMC Ordinance no. 8779/85	Established the Permanent Committee for the Environment to conduct studies, draw up plans, and introduce proposals to supplement or update the municipal regulatory system on issues related to ecology, the environment, and pollution, participating in awareness-raising campaigns and by formalizing agreements to develop training.
MUNICIPAL	HMC Ordinance no. 10.035/96	Launched a tender for waste collection services and street sweeping and cleaning. The current waste collection service contract dates from 1997 and has been extended and modified according to the city's needs through ordinances of the Deliberative Council and the decrees and resolutions of the Municipal Executive Department.
MUNICIPAL	HMC Ordinance no. 11.075/04	Authorized the hiring of licensed companies for new services of general clear-up of montones (waste piles), the cleaning of median strips on avenues, and ongoing maintenance in sectors defined by the municipal authorities, among other things.

MUNICIPAL	HMC Ordinance no. 11.237/05	Launched a tender for the provision of the MSW final disposal service through the landfill system. It establishes the formal requirements for the submission of proposals and, importantly, the relevant aspects of the service provision (technical specifications, basic equipment, methods of control and non-compliance, etc.). Includes the project for a leachate treatment plant and an MSW selection and sorting plant (both now built and in operation) and the design of an aerobic biological transformation system for organic waste (not built at the time of writing).
MUNICIPAL	HMC Ordinance no. 11.538/08	Mandated for the Municipal Executive Department to incorporate innovative processes and technologies for MSW treatment, helping to mitigate the environmental damage caused by this waste. It also authorized the department to initiate proceedings with the Provincial Government and the municipalities and communes of the metropolitan area to agree on common MSW disposal sites.
MUNICIPAL	HMC Resolution no. 12.724/08	Promoted an awareness-raising campaign on the current regulation for waste disposal in public spaces.
MUNICIPAL	DMM Decree no. 965/12, 1163/15 y 1297/11	Formalized a commitment by Municipality of Santa Fe and the Cliba company to extend the service of collecting waste piles on streets without curbs, according to the spatial distribution and schedule specified in each decree.
MUNICIPAL	HMC Ordinance no. 11.917/12	Formalized the management of special waste (not considered hazardous nor pathological, nor household–solid urban waste) requiring special treatment due to its volume. Generators of special waste are required to use a private collection service, which will be responsible for its management from source to final disposal.
MUNICIPAL	HMC Ordinance no. 12.116/14	Implemented a community bank of unused items (construction materials, furniture, equipment and other objects donated by the public) for distribution to beneficiary institutions. Not currently operational.
MUNICIPAL	HMC Ordinance no. 12.303/16	Specified the deadline for the ban on plastic shopping bags (1 March 2017) made of polypropylene, polyethylene or any other artificial non-biodegradable polymer.
MUNICIPAL	DMM Decree no. 276/13, 1266/15 y 2369/16	Agreement signed by the Municipality of Santa Fe and Urbafe to expand the collection service of waste piles on streets without curbs and to improve equipment.
MUNICIPAL	HMC Ordinance no. 12.468/18	Amended Article 19 of HMC Ordinance no. 11.917, increasing the volume allowed to be considered as a large waste generator to one cubic meter per day or two cubic meters per day in the case of pruning waste.
MUNICIPAL	HMC Ordinance no.12.697/19	Codified program for the progressive reduction and prohibition of single-use plastics.

MUNICIPAL	HMC Ordinance no. 12.738/20	Formalized "Plan for the Selective Collection and Reuse of Electrical and Electronic Waste" promoting the selective collection, reuse, recycling, and sale of electrical and electronic waste, in an effort to prevent and minimize the environmental risks associated with them.
MUNICIPAL	HMC Ordinance no. 12.787/21	Established the Municipal Composting Program.
MUNICIPAL	HMC Ordinance no. 12.804/21	Extended the life of the landfill. The Executive Municipal Department is authorized to extend the MSW final disposal service (landfill method) by seven years, mandating the drawing-up of the design project that may include the creation of a plant for the aerobic composting of organic waste. The provincial government is asked to authorize the expropriation of adjacent land for this expansion, and the municipal government is urged to formalize a regional consortium within the framework of Law 13.055.

Key City Strategies and Plans for Waste Management

The municipal government adopted Santa Fe + Limpia ("A Cleaner Santa Fe") as a core policy to ensure enjoyable, litter-free public spaces, encouraging residents to engage with the issue and work alongside the municipal government to achieve this goal. The policy recognizes that achieving these objectives and making Santa Fe a sustainable city require coordination between different government departments.

Community environmental education is another initiative for a collaborative approach to developing public policies that improve residents' quality of life. To this end, the city has drawn up The Environmental Education and Promotion Program (2024–2028) (MCSF, 2024b) which aims to "help train and consolidate environmental awareness in the community; an essential requirement for the success of the environmental public policies to be implemented." This program has various initiatives designed to promote cultural changes, at both the individual and collective levels, in order to increase citizens' environmental awareness and responsibility. In particular, it seeks to boost the recovery of recyclable materials within the city, which represents one of the municipality's priorities, both through the provision of public urban sanitation services and by raising residents' environmental awareness.

A particularly notable project is the Environmental Education Center within the Complejo Ambiental, a development that sets the standard for environmental education in the region, while deepening and diversifying options for waste recovery in the city of Santa Fe. The signing of the Commitment for a Cleaner Santa Fe (April 2024) was also critical; more than 400 city institutions were invited to join this initiative and sign social responsibility agreements for cleaner public spaces in the city.

Section 5.3 of the report (Recycling) underscores the city's move toward sorting and separating waste into dry and wet categories at source through various strategies, ranging from door-to-door collections of household waste to the installation of drop-off points for pre-sorted materials around the city.

The city of Santa Fe has prepared its Greenhouse Gas Inventory, specifically measuring the contribution of local waste management to climate change and drawing up a roadmap in its Local Climate Action Plans (MCSF, 2023b) to improve waste management for citizens "to live in a cleaner and healthier environment."

5. Waste Management in Santa Fe

Overview of Santa Fe's Waste Management System

Various sources of waste generation have been identified in the city of Santa Fe. These include generators of household, commercial and special waste, as defined by the relevant regulations. Waste collected during street cleaning and the maintenance of public spaces is also considered as a source of waste generation. Many waste collection services and systems are in operation, including those provided by the municipality and by private companies with varying levels of formality.

Finally, the city has a single formal site for final disposal in operation: the landfill at the Complejo Ambiental. For recycling, the city has a waste-sorting plant (also located within the Complejo Ambiental) as well as other formal and informal non-governmental initiatives, although these are currently underdeveloped.

Figure 5 summarizes the flows of materials generated and the types of collection and final destinations.

Waste Generation and Characterization

According to data on waste entering the landfill, Santa Fe residents generate an average of 1.1 kilograms of waste per day, an amount that is in line with statistics and data reported for other cities in the region. Table 3 summarizes the results of a waste characterization study of the city of Santa Fe by La Ciudad Posible.

TABLE 3
Waste Characterization in the City of Santa Fe

MATERIALS	TONS PER YEAR	PERCENTAGE BY WEIGHT
Paper and cardboard	7,090	10.40
Plastics	8,701	12.77
Glass	3,514	5.15
Metal	968	1.42
Textile materials	1,763	2.59
Disposable diapers and bandages	6,406	9.40
Garden and pruning waste	1,797	2.64
Materials from constructions and demolitions	128	0.19
Food waste	31,673	46.47
Others (*)	6,120	8.97
Total	68,160	100

(*) includes wooden waste, rubber, leather, cork, batteries, electrical equipment, medications, hazardous waste and other miscellaneous waste.

Source: (La Ciudad Posible, 2014)

FIGURE 5

Waste streams by type of generator and service, based on average processed at the Complejo Ambiental (2011-2020). Created by the authors, based on 2024 data provided by the MCSF.

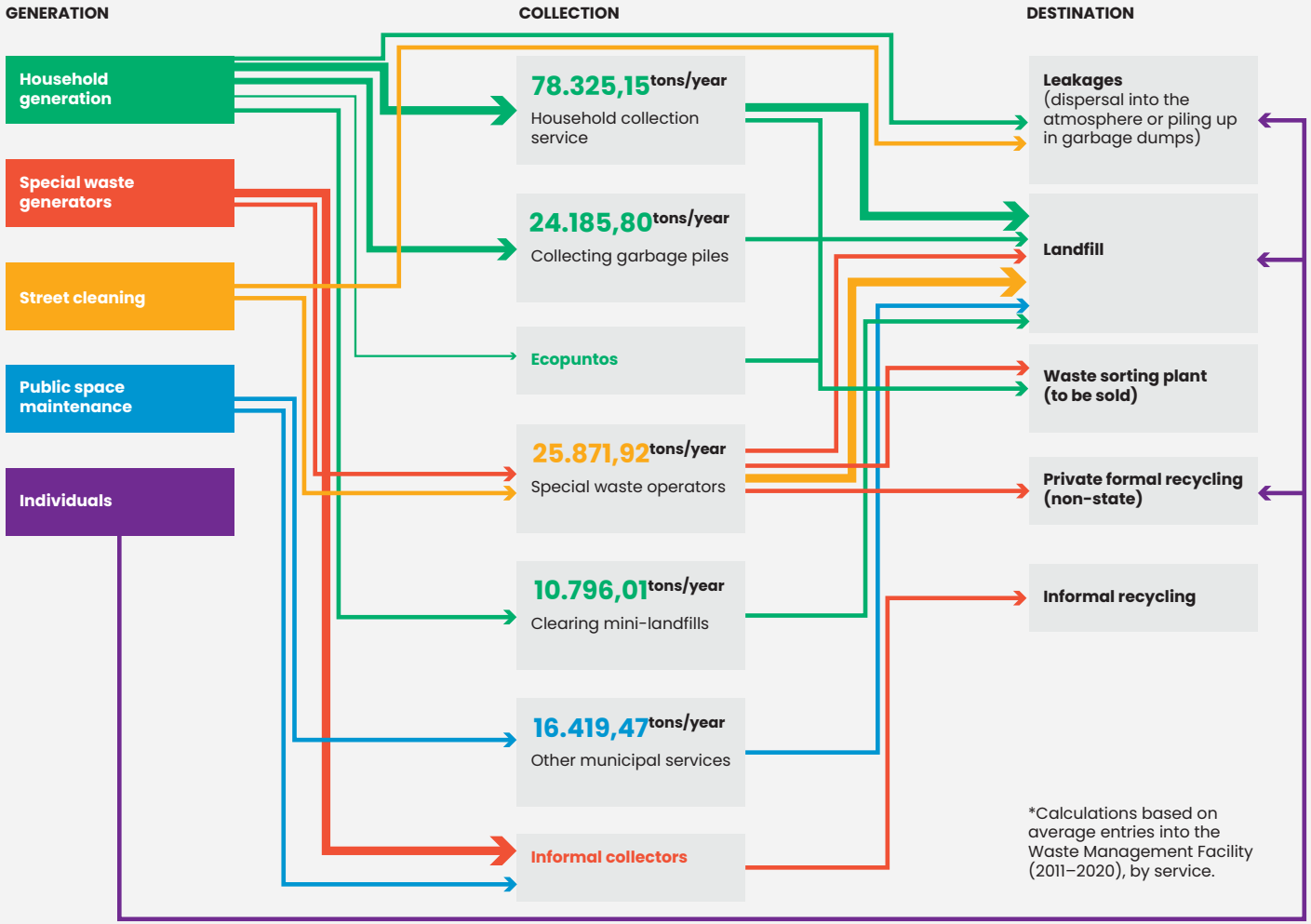


FIGURE 6

Destination of materials entering the Complejo Ambiental. Created by the authors, based on 2024 data provided by the MCSF.

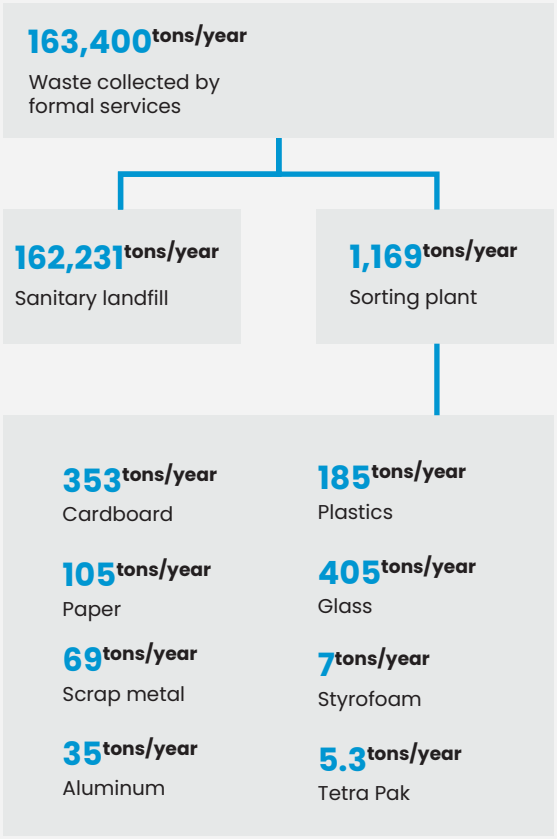


FIGURE 7

Sample from 2024 mass media campaign for separated waste collections.

Figure 6 describes the categories of waste currently recovered by the waste-sorting plant of the Complejo Ambiental, based on the total entering the facility.

Recycling

The waste classified at the Complejo Ambiental de Santa Fe is sold to various nearby industries, chosen due to sale price of the materials and logistical factors linked to their transportation. Some of the industries that regularly purchase sorted materials are located in the adjacent Entre Ríos province.

There are also some recycling-related industries and initiatives on the outskirts of the city, particularly for paper and cardboard, as well as different kinds of plastics and glass.

Santa Fe was one of the first cities in the country to establish separate waste collection, having started in 2011. The general sorting established the separation of waste into two types: dry and wet waste.

"Dry waste" refers to discarded items or materials that can be recovered and recycled, including paper, cardboard, plastics, grass, metals, TetraPak, textiles and expanded polystyrene. Municipal directives stipulate that food packaging must be clean and without organic remains such as juices, milk or oils upon disposal. Categorized waste is collected twice per week (on Mondays and Thursdays), from 7 a.m. in areas with daytime collections, and from 8 p.m. in areas with nighttime collections.

"Wet waste" is the term used for discarded fruit, vegetables, meat, grass, tea bags, coffee grounds, paper wrapping and packaging with food remains. It also includes bandages, diapers and plastic bags. This waste is collected four times a week (on Tuesdays, Wednesdays, Fridays and a weekend day), from 7 a.m. in areas with daytime collections, and from 8 p.m. in areas with nighttime collections. During weekends, collections are made on Saturdays in areas with daytime collections and on Sundays in areas with nighttime collections.

Another option for waste separation, although not a household service, is the Eco Punto system and recycling campaigns, whereby the municipality provides specialized facilities to receive and sort clean and dry recyclable waste. Some Eco Puntos provide a personalized service informing residents about the importance of separation at source and of recycling. The following materials are received from residents, in exchange for seedlings or wood chips:

- Paper and cardboard;
- Plastics and expanded polystyrene;
- Metals (aluminum cans);
- Glass;
- Textiles;
- Discarded electrical and electronic equipment.

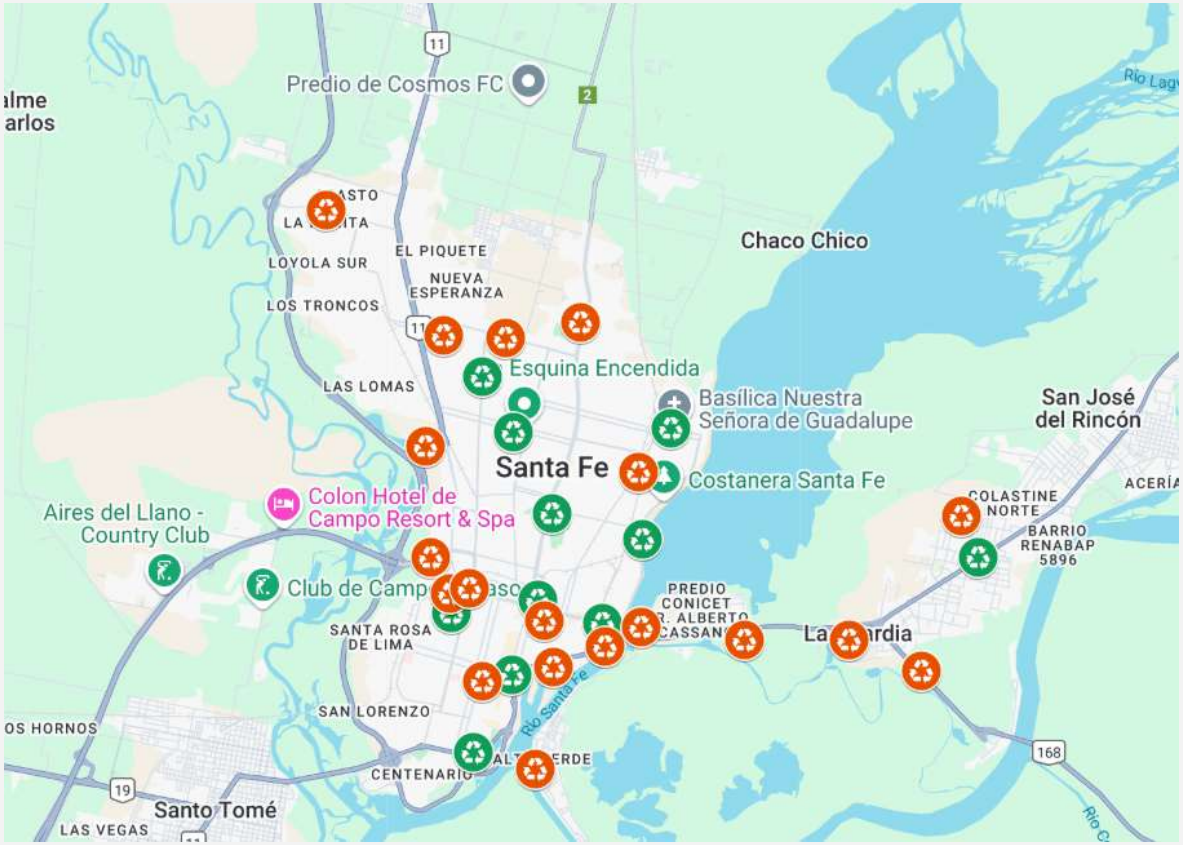
FIGURE 8
Eco Punto Santa Fe

FIGURE 9
Campaigns for recycling specific materials

Source: MCSF

FIGURE 10

Coverage of the Eco Puntos network in the city of Santa Fe (MCSF)



Waste Collection and Transportation

Nearly all of Santa Fe's urban sanitation services are contracted under concessions. The current contract dates from 1997 and has been extended and modified in accordance with the city's needs through decrees and resolutions of the Municipal Executive Department. Two companies (Cliba and Urbafe) provide these services. Specifically, they deliver:

- household collections (six times per week, in daytime and nighttime sectors);
- manual or mechanical street sweeping (one to three times per week, depending on the city sector);
- collection of branches and voluminous waste (one to three times per week, depending on the city sector);
- cleaning of micro-landfills (depending on municipal planning).

The municipality has also strengthened or added to the above services in different parts of the city, ensuring coverage for waste collection for all households in the city (Figure 11).

Waste Treatment and Disposal

For waste treatment and final disposal, the city of Santa Fe has a landfill (operated by Milicic), a leachate treatment plant and a dry-waste sorting plant (operated by the Asociación Civil Dignidad y Vida Sana), all located within the Complejo Ambiental.

Each day, between 500 and 600 tons of waste enter the Complejo Ambiental. An estimated 98 percent of this inflow of waste is disposed of in the facility, which, despite its limited capacity, is the only official landfill in operation in the region. The remaining fraction – mainly "dry" waste separated at source – is destined for some form of recycling. However, processing capacity generally cannot keep up with the inflow of recyclable materials.

Figure 11 shows the typical composition of the city's solid urban waste. The high proportion of organic waste presents a key opportunity for composting. The figure also demonstrates the high proportion of recyclable materials, including plastic, glass and paper, indicating high potential for recycling. Additionally, plastic materials account for a large proportion of street litter (Figure 12).

Waste management is one of the largest items on the municipal budget. For 2025, $41,006,641,729 ARS (about $35 million USD) – or 18.22 percent of the entire budget – is allocated to waste collection, street sweeping and cleaning alone (MCSF, 2024a). The city's Department for the Environment and Urban Management, which is responsible for waste collection services, spends about 35 percent of the municipality's entire budget.

FIGURE 11
Municipal solid waste composition in Salvador (CIL, 2024)

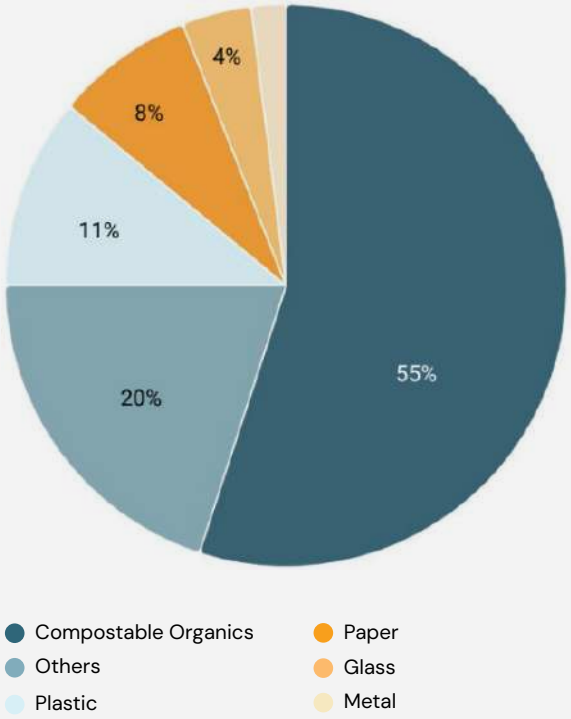


FIGURE 12
Litter Material Breakdown (CIL, 2024)

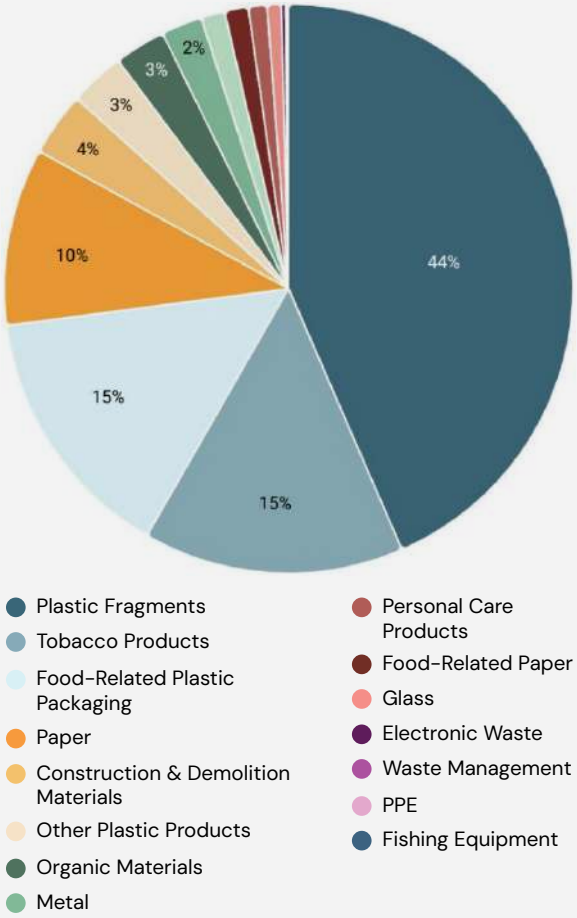


FIGURE 13
Complejo Ambiental de Santa Fe

Source: Periódico Pausa

FIGURE 14
Complejo Ambiental Landfill

Source: Mauricio Centurión

Informal Recycling Sector

Tracking the informal recycling sector, particularly waste pickers, is a major challenge due to the lack of records and systematized information. No organization currently collects data about informal, independent collectors or *acopiadores* (intermediaries working in the sector), making it difficult to identify and regulate them. Notably, it is known that some materials are not collected by formal municipal services. Instead, they are recovered, collected and resold through informal channels. The municipality recognizes the existence and activity of informal collectors, cooperatives and *acopiadores*, but there isn't an updated or complete register of these actors and their activities, nor is there any reliable data available to compile annual figures.

Nevertheless, the city's first punto *limpio*, a collection hub where independent and informal waste collectors can deliver recyclable materials, was inaugurated in early 2025, with a cooperative of waste pickers being responsible for receiving and managing the waste. The cooperative Reciclando Nuestros Sueños (Recycling Our Dreams) will perform this function in the first hub, integrating independent waste pickers into the cooperative system.[2]

This initiative will mark the beginning of a process to concentrate and register informal sector workers, helping to reduce the proliferation of informal systems and to incorporate them into a legal framework. The aim is to carry out a survey during 2025 to register informal sector workers, monitor their activity, and evaluate and recognize their impact on the waste management system. The goal is to have four or five more puntos limpios by the end of 2025. Carrying out the census and consolidating the "puntos limpios" will be vital for the expansion and improvement of the city's waste management system.

2 A cooperative is an autonomous association of people who voluntarily come together to meet their social, cultural and economic needs and aspirations through a democratically run and jointly owned enterprise. Cooperatives are mutual organizations that provide services to their members and are therefore subject to cooperativism's "Golden Rules" – a set of guiding values and principles (Instituto Nacional de Asociativismo y Economía Social, 2020).

6. Key Findings and Opportunities

Key Findings

The Circularity Assessment Protocol Report for Santa Fe (CIL, 2024), developed by the Circularity Informatics Lab at the University of Georgia, informed this process by outlining challenges and opportunities for circular waste management in Santa Fe. The project team, working alongside the Municipality of the City of Santa Fe, R-Cities, and the Universidad Nacional del Litoral, held regular team meetings, carried out documentary research and facilitated workshops to define an appropriate solution for the Santa Fe context based on these challenges and opportunities.

Plastics represent 90 percent of all mass-consumption packaging, including to-go containers used in the city's restaurants and rotiserías (take-away delis). The most commonly used materials for basic food packaging and sanitation/cleaning are PP, PET, and HDPE. Opportunities identified in this context include:

1. **Convenience products with PET and multilayered plastic laminates must be prioritized in conversations about Extended Producer Responsibility (EPR) and product redesign.**
2. **The need for new and broadened incentives for the use of alternative materials to plastic (cardboard and paper packaging, reusable materials, bulk sales) at retail stores and local takeaway restaurants.**
3. **Identifying opportunities to expand the collection and recycling of highly recyclable products (PP, PET, and HDPE) at businesses and other collection points (expand existing network).**

Opportunities

After evaluating the actions for impact and viability, four key opportunities were prioritized to be presented to and evaluated by key community stakeholders. The opportunities that were prioritized were Eco Puntos, composting and valorization, micro-landfills, and plastics used for food packaging.

Eco Puntos: expanding and optimizing the network of fixed collection points for recyclable waste (cans, glass, paper, and cardboard, plastics and expanded polystyrene, batteries and electronics) distributed throughout the city. This promotes recovery, valorization, and reuse of recyclable materials for their reincorporation into the value chain, reducing the volume of recyclable waste that is not recovered and extending the lifespan of the landfill.

Informal dumpsites: developing strategies to minimize and/or eliminate unauthorized dumpsites. The impact lies in preventing soil degradation, water and soil pollution, disease vector proliferation, blocked drainage (storm drains, open drains, gutters) and while also improving the urban landscape.

Composting and Valorization: promoting composting practices and strategies, and/or the recovery of the organic fraction of urban solid waste at the level of the household, business, industry, institution or on a centralized basis.

Plastic food packaging: reducing the distribution of single-use plastics in restaurants, bars and *rotiserías* (take-away delis), incorporating recycled and/or organic materials, and increasing returnability and recyclability. The impact would be observed in the reduction of the leakage of plastics into water bodies and the environment more broadly, along with a reduction in the volume of waste sent for final disposal and an increase in the lifespan of landfills.

Selected opportunities were analyzed and evaluated, and then concrete actions were proposed with a dynamic and inclusive approach, involving key stakeholders in Santa Fe's waste management. During the two sessions, 105 ideas were collected for the four priority opportunities and, through an implementation matrix, 24 initiatives were selected (six for each opportunity). The program team then analyzed and evaluated the 24 prioritized initiatives and defined the key initiatives to fast-track solutions, with a focus on two interrelated proposals.

The selected opportunity led to the design of a plastic materials treatment and recycling plant, linked to a wider network of Eco Puntos, to increase both the amount and quality of the plastic waste recovered for treatment.

PLANT FOR TRANSFORMING RECOVERED MATERIALS

A mechanical recycling plant is envisioned for highly recyclable plastics such as PET, HDPE, and PP, incorporating processes such as sorting, shredding, compacting, bailing, melting, and/or extrusion of the plastic materials. Thermal treatments to produce energy from waste are not considered. Recycled and processed plastics can be used to manufacture products such as street furniture, speed bumps, benches, playground games, and/or urban art. The level of complexity in the treatment can vary depending on how the initiative develops. This recycling initiative would support the circular economy by reincorporating valuable recycled materials into the urban landscape and economy.

EXPANDED NETWORK OF ECO PUNTOS

To ensure its sustainability, the project also includes the expansion of the network of Eco Puntos by setting up 40 new sites to receive recyclable materials across the city,

in addition to redesigning and optimizing the collection system to increase the amount of available materials for processing.

Associations with intermediaries such as clubs, neighborhood associations, and schools will be promoted to incentivize the installation of these facilities and raise environmental awareness; private companies can also be invited to sponsor Eco Puntos.

Please refer to the Santa Fe Project Statement for a detailed and actionable proposal to improve waste management and build a more circular economy in Santa Fe based on the selected.

HIGHLIGHTS OF THE SELECTED OPPORTUNITY:

- The sorting plant located in the Complejo Ambiental has the capacity to process more material than it does at present.
- The Municipality of Santa Fe plans to open four or five puntos *limpios* in the city, expanding the coverage of the recycling system and improving waste management.
- The incorporation and formalization of the informal sector (collectors), through a survey and the implementation of these puntos *limpios*, offers a key opportunity to strengthen the recycling system. This process will make it possible to structure the informal sector, improve the traceability of recycled materials and optimize waste management, increasing the system's efficiency and broadening its impact.
- Various industries in the Greater Santa Fe area require raw materials of recycled origin.
- Areas of the Greater Santa Fe have made a "metropolitan commitment" that articulates the need for integrated waste management to reduce the amount of materials being sent to landfill.

TABLE 4
Participants in the Opportunity Assessment Tool

Participating stakeholder group	Number of people per group
Government organizations	30
Non-government organizations	5
Waste collection companies	3
Stores and businesses	6
Academia and scientific organizations	17
Business associations and chambers of commerce	6
Finance organizations	1
Media	3
Total	71

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