

The Houston-Galveston Area Council (H-GAC) is the state-designated agency for solid waste management issues in the 13-county region.

H-GAC's Solid Waste Management Program, started in 1983 by the Texas Comprehensive Municipal Solid Waste Management Resource Recovery and Conservation Act, is funded by the Texas Commission on Environmental Quality (TCEQ) through tipping fees, which are fees collected at landfills across the state by anyone disposing of waste in a landfill. Solid waste management is the proper handling and disposal of garbage, recycling, and composting including drop-off sites, household collections, special events, and enforcement of illegal dumping. Effective solid waste management can decrease the amount of waste disposed of improperly and extend the life of landfills by reducing the amount of material discarded.

The solid waste disposal, enforcement, and recycling landscape around the nation, the state, and the 13-county Houston-Galveston region has changed tremendously over the past four decades. Because the population of the Houston-Galveston region has more than doubled since 1980, its solid waste management needs have also changed.

Solid Waste Management Planning Begins at H-GAC

In the 1980s and 1990s, the most recycled materials were paper, cardboard, and scrap metal. Today¹, more materials can be recycled including plastics, various types of metals, used electronics, and food waste.

This expansion of recycled materials represents a change in the waste stream and in society. The solid waste management industry must also change by providing more opportunities for recycling and working together to reduce contamination through clear and consistent messaging.

In 1983, the H-GAC board of directors received a recommendation from its Solid Waste Issues Committee to start a solid waste management program. In the region's 1985 Solid Waste Action Plan Summary, the goal of the committee was "to develop a plan of action for efforts in regional solid waste management."

At that time, a growing concern in the region was the closure of local landfills, which communities believed would lead to more illegal dumping. Communities were also concerned that the region would run out of landfill capacity.

Today, the region has yet to run out of capacity; however, the geographic location of the landfills is not evenly distributed across the region. H-GAC continues to review landfill permits and other municipal solid waste facility permits for conformance with H-GAC-Regional 2022-2042 Solid Waste Management Plan.

In 1985, the Texas Department of Health approved H-GAC's Regional Solid Waste Management Plan to guide the growth and development of solid waste management in the 13-county service region.

¹ "Today" refers to pre-covid trends. During covid, recycling and waste stream trends changed, and in 2023, they were returning to normal. Now and Then: A Look Back at 30 Years of Recycling - Waste Advantage Magazine https://wasteadvantagemag.com/now-and-then-a-look-back-at-30-years-of-recycling/



The current, 2022-2042, Solid Waste Management Plan can be found on H-GACs website by visiting: h-gac.com/go/solid-waste-publications



H-GAC's Regional Solid Waste Management Plan

H-GAC replaced its 1985 Action Guide for Solid Waste Management in 1994 and amended it in 2001 to include goals and recommended actions to:

- Increase recycling in the region.
- Decrease the per capita disposal rate.
- Increase access to special waste disposal or recycling including household hazardous waste (HHW), used electronics, and construction materials.
- Increase public awareness of disposal and recycling options through large-scale regional campaigns.
- Develop a closed landfill inventory.
- Increase data collection and analysis for the region.

On January 18, 2022, the H-GAC Board of Directors approved the adoption of the 2022-2042 Regional Solid Waste Management Plan* and authorized its submittal to the Texas Commission on Environmental Quality (TCEQ). TCEQ approved and adopted the plan on July 19, 2023.

The plan was developed through an extensive process, which included working with the H-GAC board-appointed Solid Waste Management Committee, surveys of local governments, research, conversations with experts, virtual listening sessions throughout the region, and a public hearing. Included in the plan is a new set of goals to reflect the region's intentions for the next 20 years, such as:

- Supporting the creation and expansion of materials management programs.
- Supporting research and data collection efforts and market development.
- Focusing on the economic impact of sustainable materials management.

*Texas Health and Safety Code §363.062 requires Regional Solid Waste Management Plans. Contents of the plan are described in §363.064 of the same code and provided in Title 30 Texas Administrative Code, Chapter 330, Subchapter O.

The 2022-2042 Regional Solid Waste Management Plan details the current status, and projections in five-year increments through 2042, of solid waste management and demographics in the region, and provides goals, objectives, and recommended actions for the region's solid waste management activities.

Based on historical data of waste generation in the region, the average daily disposal rate per person of 7.25 pounds is not predicted to change overall, although it will rise or fall depending on the year. In contrast, the recycling rate for the region is expected to increase over time. The increase is predicted as a result of society continuing to shift to using more disposable products, greater technology to capture and recycle those products, and the availability of more recycling programs.

In 2022 the region had an estimated recycling rate of 2.58 pounds per person per day. By the year 2042, the recycling rate is estimated to be 3.3 pounds per person per day.

Applications for grant funding through the TCEQ Solid Waste Management Grant Program must address at least one of the goals and objectives in the plan. New municipal solid waste facility applications, which include landfills, must conform with the plan. H-GAC will continue to determine the types of training programs and resources needed based on the recom-mended actions of the plan.

Municipal Recycling Programs by Year:

The number of municipal recycling programs in the 13 county Houston-Galveston region has increased steadily since the first plan was adopted in 1985.

1985:

1994:

2021:





Collection of Household Hazardous Waste (HHW) History in the 13-County Region

- In the 1985 regional plan, HHW was not specifically mentioned.
- By 1992, the regional plan documented two private collections of HHW and the city of Houston was conducting a pilot HHW collection.
- In 2021, 90% of residents throughout the 13-county region had access to either permanent facilities or periodic events for HHW collection.

Since the beginning of H-GAC's Solid Waste Management Program, the organization has played a significant role in the improvement of solid waste management by helping local governments meet the changing needs of their residents and communities.

H-GAC's Solid Waste Management Program engages in the following solid waste activities throughout the region and across jurisdictional boundaries:

- Administers the TCEQ's Solid Waste Management Grant Program at the regional level.
- Hosts free workshops, webinars, and training for communities and law enforcement.
- Provides print and digital resources for community use, including informational materials and online resources.
- Increases efficiencies through solid waste facility reviews, regional solid waste studies and plans, special solid waste projects, and regional contracts for disposal and recycling services.

In 1983, there were 62 permitted landfills in the region, 50 of which were owned by cities, counties, universities, or the state. In 2023, there are 27 active permitted landfills and only one is municipally owned. Additionally, throughout the years community members have begun looking for ways to recycle or properly dispose of used electronics and household hazardous waste (HHW), such as cleaning supplies, paint, and pool chemicals.

Regional Administration of TCEQ's Solid Waste Management Grant Program

H-GAC has awarded and overseen the investment of \$32,652,338 in grant funds throughout the region since 1993. These grant funds come to H-GAC through the TCEQ Solid Waste Management Grant Program and are used for solid waste management projects.

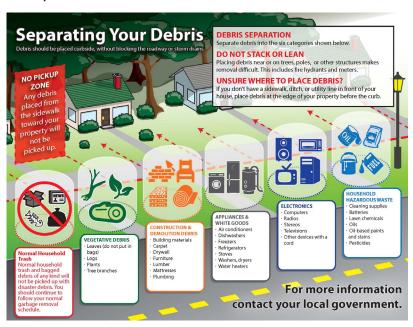
Regional councils of government, like H-GAC, administer the program across the state, ensuring that local experts, who are familiar with the region's needs and issues, evaluate grant proposals.

H-GAC has awarded funds for projects in all 13 counties and has funded 17 regional projects, which include multiple counties and jurisdictions. In addition, it supplied the early funding for cleanup and education as part of River, Lakes, Bays 'N Bayou's Trash Bash, the largest single-day waterway cleanup event in Texas.

The grant program benefits the local solid waste community often providing seed money for projects that are not in city or county budgets. Without grant funds, these projects may either have been implemented at a much smaller scale or not at all.

All projects protect the environment and safeguard health, general welfare, and physical property. Successful projects can become self-sustaining over time and produce long-term benefits for communities.

The grant program has funded 574 projects, including 120 grants used for construction, expansion, or improvement of recycling centers, transfer stations, and household hazardous waste facilities. Between 2008 and 2021 the grants program funded the collection of 3,637 tons of waste and 331,294 tons of recyclables.



Grant Funding by Category

Projects Funded	Grants	Total Amount
Citizens' Collection Stations & "Small" Transfer Stations	9	\$403,588
Education & Training	72	\$3,908,551
Household Hazardous Waste Management	94	\$5,986,414
Local Environmental Enforcement	111	\$7,048,023
Litter & Illegal Dumping Cleanup	48	\$1,095,083
Local Solid Waste Management Plans	1	\$75,000
Source Reduction & Recycling	223	\$13,181,439
Technical Studies	16	\$954,239
Total:	574	\$32,652,337

Grant Funding by Geography

County	Grants	Total Amount
Austin	29	\$1,242,546
Brazoria	55	\$2,728,636
Chambers	14	\$537,147
Colorado	14	\$478,870
Fort Bend	64	\$2,780,089
Galveston	57	\$2,730,793
Harris	164	\$12,289,163
Liberty	17	\$574,090
Matagorda	28	\$1,564,961
Montgomery	43	\$2,401,410
Walker	35	\$1,645,522
Waller	7	\$397,194
Wharton	24	\$857,244
Regional	17	\$2,129,050
Subregional	6	\$295,622
Total:	574	\$32,652,337





10,881









2,554,462



6,489,567





4,862

Illegal Illegal dumping dump sites offenders investigated identified

Pounds of recycling collected at community collection

events

113,401

272,776 **Tires**

collected

Pounds of waste collected at community collection events

Pounds of electronics collected

Pounds of household hazardous waste collected

Pounds of waste removed from illegal dump sites

Pounds of recyclables diverted from landfills





Regional Reach

Regional projects benefit residents and visitors throughout the region. Regional projects include workshops and training, publications and messaging campaigns, online tools and resources, and large-scale community cleanups.

Regional projects funded during the first five years (1993-1998) of the Regional Solid Waste Management Grant Program, focused on improving curbside, drop-off, and mobile recycling programs including upgrading and expanding existing facilities; adding capacity to communities to engage in enforcing illegal dumping laws; and developing or improving composting and yard waste programs.

Since 2019, the grant program has funded projects directed toward:

- New technology.
- Tire collection events.
- Facility enhancements or expansions.
- Illegal dumping enforcement surveillance equipment.
- HHW collection including used electronics.

It is no surprise that used electronics recycling is a popular program throughout the region. The average American has access to more than ten connected devices in their households, including televisions, phones, cameras, wearable technology, and home automation.

As these products are updated and replaced, more people are in search of the right way to recycle or properly dispose of their electronic devices. In fact, some used electronics include valuable metals that can be recycled, which can help cities and counties offset the expense of recycling items that are more costly to recycle and contain hazardous materials.

Local Impact Case Study: Fort Bend County Recycling Program

For more than 25 years, the Fort Bend County Recycling Center has provided services for residents throughout Fort Bend County. The program receives support from the Regional Solid Waste Management Grant Program and serves between 1,000 and 1,500 households today.

The center is open to the public on Mondays, Tuesdays, Thursdays, Fridays, and Saturdays. Fort Bend County residents access the center by driving through the warehouse where staff and volunteers help collect and sort the materials.

Residents can bring in a variety of materials, including recyclables such as paper, glass, and plastic; household hazardous waste such as paint and chemicals; gasoline; fluorescent light bulbs; both used car and cooking oil; batteries; textiles, including clothes, shoes, and linens; used electronics; tires; and household appliances. There are limitations on certain recycled items and in those cases, residents are charged a small fee.

A few of the center's key accomplishments are:

- Between 2020 and 2022, the center served 34,742 residents and collected more than 1 million pounds of recyclables.
- Between 2018 and 2022, the center collected more than 884,000 pounds/gallons of HHW.
- In addition, between 2001 and 2021, the Fort Bend County Recycling Center received more than \$500,000 in grant funding to enhance and expand services.

Grant funds from H-GAC's Solid Waste Program have supported the purchases of:

- Large containers for collecting and temporarily storing recyclables, including hoppers for plastic as well as cardboard and roll-off containers.
- A bulb eater to properly and safely dispose of compact fluorescent light bulbs and tubes.
- Five balers, two of which are dedicated to compacting plastics.
- Storage for HHW.
- A large ceiling fan for air circulation and comfort.
- A tractor-trailer for transporting used electronics, and a 3/4-ton pickup truck, and a forklift.

The center is staffed by three full-time employees and four part-time employees. In the winter months, the center usually welcomes two volunteers from Fort Bend Master Gardeners.



"Thanks to the help of the Regional Solid Waste Program Grants from H-GAC, we've become a successful recycling facility for the Fort Bend County residents who do not have recycling pickup or who haven't had a place to dispose of HHW in the past."

> **Bruce Niemeyer Fort Bend County HHW/Recycling Coordinator**



"We try to provide a one-stop shop for residents to dispose of their household hazardous waste. We've been very fortunate. The county has put in a lot of time, money, and effort for the program, and the grant funding has been the icing on the cake. The grant funding from H-GAC made it a better program. Now, we are an established program and don't apply for the H-GAC grant funding anymore. We want to see those funds go to other communities that need it."

Cheryl Burton-Fentress Harris County HHW Program Manager

Local Impact Case Study: Harris County Household Hazardous Waste Program

With support from the Regional Solid Waste Management Grant Program, the Harris County Household Hazardous Waste (HHW) Program has collected more than 5.9 million pounds of HHW at their permanent facility and through their HazMobile collection events, benefiting more than 46,000 households.

The program, which is part of the Harris County Engineering Department, began in 2001 as part of the county's stormwater permit. At its start, the county hosted four large collection events for residents in the spring and fall. The HHW program is now staffed by a full-time manager, two full-time staff members, and six temporary workers during special events.

As resident participation grew, the program evolved to include a HazMobile program providing eight onsite HHW collection events at various places in the county each year. The county also expanded its facility to accommodate resident drop-offs two days per week and two weekends per month. Today, between 5,000 and 6,000 residents drop off HHW through the HazMobile program and the permanent facility each year.

Between 2004 and 2009, the Harris County HHW Program was awarded more than \$858,000 to enhance and expand services including:

- Adding electronics recycling temporarily to special collection events.
- Purchasing a gooseneck trailer, dually truck, 14-foot flat-bed trailer, other necessary equipment; and a shed and security fencing for the HazMobile collection program.
- Renovating three buildings to house the HHW program's operations and office.
- Supporting a training program with tables, chairs, dedicated computer, projector and screen.
- Adding a 16-foot flatbed trailer, hoppers, a forklift, a hazardous materials storage locker, a segmented HazMat locker to store flammables and corrosives; a paint can crusher, and other equipment to improve facility and event efficiency.



Local Impact Case Study: Walker County Environmental Criminal Enforcement Program

With a population exceeding 78,000 people, Walker County is experiencing growth at historic rates. Easy access by interstate and state highways connecting the county to several urban centers combined with thousands of acres of isolated undeveloped land, including a national forest, state lands, and local agricultural operations, has made the county an ideal target for illegal dumping and disposal activities.

To combat the threats to the health and safety of its residents and visitors, Walker County created an environmental investigator program in 1996 using Regional Solid Waste Grant Program funds and direct funding from the Commissioners Court of Walker County.

Walker County's Environmental Criminal Investigations Program is one of the longest-standing and most effective law enforcement programs in the State of Texas dedicated to eliminating the negative health, safety, and economic impacts of the improper storage and disposal of solid waste and other environmental offenses.

Walker County Commissioners Court expanded the program to two full-time investigators. These added investigators have allowed the county's program to continue to address the growing environmental impact of increased development and population, and the impacts of neighboring communities on the people and landowners of Walker County.

Walker County's program has been instrumental in mentoring and training investigators from all over Texas on how to conduct an investigation of any crime that has an environmental component. They have been able to train others on illegal dumping, improper storage or disposal of solid waste, illicit discharge into waterways, and illegal burning of solid waste.

For the past 28 years, Walker County investigators have:

- Managed thousands of complaints from felony to misdemeanor level violations.
- Educated the residents of Walker County, and all of Texas, about the law and the impacts that illegal dumping and improper disposal have on health, safety, and communities.
- Affected the proper disposal of hundreds of thousands of pounds of illegally dumped materials from private and public lands.

Walker County's Environmental Criminal Investigations Program is a shining example of the benefits of leveraging partnerships between local, regional, and state agencies to create and sustain local programs. Programs that protect the communities of Texas so that they can grow and develop in a way that is healthy and safe and provides a better standard of living for the residents who live there.



"Everyone in Texas is represented by local governments, regional councils of government, and the state government. When you see all three cooperating to serve the citizens with a program like ours, it is a great thing. Not only does it benefit the citizens of Walker County, but it also serves as an example to other communities on how we can cooperate to create sustainable, efficient, and successful programs in the future. As developments, populations, and densities increase, it is important to make sure these increases do not negatively impact the health, safety, and quality of life of our citizens, and our Environmental Investigators working each day for Walker County."

> Andrew Isbell **Walker County Director of Planning & Development**



Solid Waste Training & Education

Through the years, H-GAC has invested in training opportunities for community members and organizations by hosting seminars and workshops throughout the region. H-GAC has maximized its reach with webinars and online meetings.

H-GAC offers these quality training opportunities by engaging the best industry professionals and expert consultants to provide educational content at no charge to participants at a value of \$100,000 just since 2018. These free, hands-on trainings demonstrate H-GAC's commitment to helping communities save money so more can be spent on direct resident services.

In 2013 and 2017, H-GAC won awards from the Texas Environmental Law Enforcement Association and Keep Texas Beautiful for environmental enforcement work, including convening environmental enforcement networking and peer exchange groups among law enforcement and code enforcement officers.

In addition, H-GAC collaborated with law enforcement and the Harris County District Attorney to develop an Environmental Circuit Rider Program. The program was offered to law enforcement, district attorneys, and justices of the peace in the region equipping them with the tools needed to properly investigate illegal dumping and prosecute and educate illegal dumping offenders. As part of the free program, the Harris County District Attorney's office remained on retainer or was sworn in at other courts to help prosecute cases.

Disaster Debris Preparedness

When Tropical Storm Allison devastated parts of the region in 2001, it highlighted how important preparation for debris removal is for the region. In response, H-GAC began offering disaster debris training, resources, and services to communities.

For 15 years, H-GAC's Solid Waste Management Program and HGACBuy Cooperative Purchasing Program offered disaster debris clearance and removal services contracts. This service helped communities quickly and easily procure a disaster debris hauler until the program was phased out as local governments gained the capacity to successfully procure contracts. HGACBuy continues to offer debris monitoring services through the All-Hazards Preparedness, Planning, Consulting & Recovery Services.

H-GAC continues to offer disaster debris workshops, which give communities the tools they need to respond to and recover faster from disasters. H-GAC also offers free, online resources for disaster debris programs, including informational videos and posters that communities can use in their own communi¬cations with residents. H-GAC Solid Waste disaster debris materials are available at: https://www.h-gac.com/solid-waste-management/disaster-debris-cleanup-and-management

A Resource for the Region

H-GAC has a robust solid waste outreach and education program with the goal of saving local government time and money by providing much-needed resources, such as outdoor burning regulations guides, illegal dumping education, and disaster debris management posters and videos.

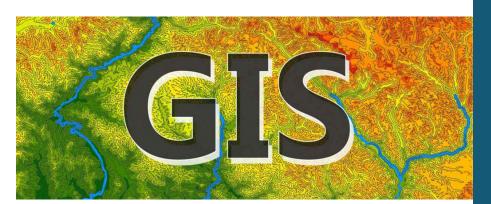
This is done by supplying free print and digital resources for communities. Resources include informational materials, such as brochures, flyers, and videos; children's activity books; and online resources, including a closed landfill inventory, mapping applications, and monthly shareable social media posts.

From 2003 to 2012, H-GAC produced a print recycling guide that included tips for recycling and a list of municipal and county recycling sites throughout the region. After ten years, the printed guide evolved into a website that could easily be updated. Today, it is available as a Geographic Information System application.

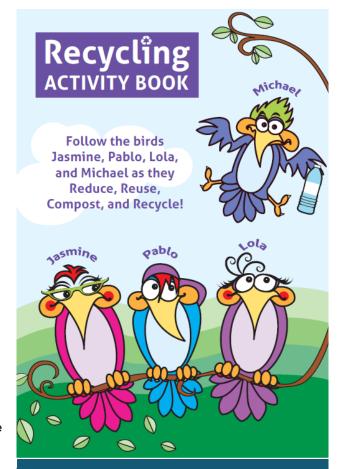
Educational materials on the H-GAC website can be reproduced easily and distributed to the community. In fact, some public-facing content, such as posters and videos explaining what residents should do with household debris following a disaster, are available without H-GAC branding. This allows communities to incorporate their own branding for resident recognition. These disaster debris tools have been used across the state, country, and even internationally.

Through the years, H-GAC's effort to provide outreach and education tools transitioned from primarily print materials to digital resources. Most of the print materials H-GAC provides are available online for print-on-demand or are digital-first content, such as monthly shareable social media posts.

From 2020 to mid-2023, H-GAC's Solid Waste Education Tools web page had 385 visitors who downloaded digital resources 280 times. This does not include resources that were found on other web pages, including YouTube, or that were directly requested from H-GAC staff.



Explore H-GAC's GIS-based application at: https://datalab.h-gac.com/SWF/





H-GAC has won awards for solid waste outreach and education efforts from Keep Texas Beautiful and the State of Texas Alliance for Recycling. According to the 2013 H-GAC study, The Economic Contribution of the Recycling Industry to the Houston-Galveston Region, the recycling industry helped bolster local economies by accounting for more than 24,000 jobs throughout the 13-county H-GAC region and contributing over \$5.8 billion in economic output.





Addressing the Region's Needs

Through the Regional Solid Waste Management Program, H-GAC coordinates solid waste conversations across jurisdictional boundaries and increases efficiencies through solid waste facility reviews, regional solid waste studies and plans, special solid waste projects, and regional contracts for disposal and recycling services.

H-GAC developed special studies throughout the region, including those that show the economic impact of the recycling industry in the 13-county region and an assessment of the disaster debris preparedness of local governments in the region. These regionally specific studies give local leaders a more exact picture of local community needs than a national or statewide report would provide.

Seeing a need for a permanent solution for the proper disposal of pharmaceuticals, H-GAC researched existing permanent disposal locations across the region and partnered with 18 communities to ensure that there was at least one location in each county.

Regional contracts for the collection, recycling, and disposal of household hazardous waste and used electronics are also available through H-GAC. By using these contracts, communities throughout the 13-county region can work directly with selected companies to set up a collection of materials from permanent facilities or special events without conducting their own lengthy and costly RFP processes.

H-GAC also conducts reviews of permit applications for solid waste facilities to ensure conformity with the Regional Solid Waste Management Plan. This process also gives local communities the chance to insert local and regional input and comment into the record to ensure permits are not approved by TCEQ engineers in Austin without local feedback.



Moving Forward

Looking forward to the next 20 years of regional solid waste management programming, H-GAC will continue to provide tools and resources to support waste reduction and recycling and demonstrate how solid waste management and recycling is more than an environmental concern but an economic and quality of life opportunity.

Even with the increased popularity of and access to recycling, the rate of waste generated has increased in the past four decades. In 1980, the amount of waste generated per person was five pounds per day. By 2021, that amount increased to 6.52 pounds per person per day. This can be attributed in part to changing consumer habits such as a greater reliance on disposable products and increased purchasing.

We will all need to work together to make the biggest impact on managing waste in the most sustainable, economical, and safe way.

H-GAC will continue to work with local governments and other groups to address solid waste management challenges in innovative and effective ways.

In the upcoming decades of H-GAC's Solid Waste Management Program, training opportunities and the sharing of knowledge will continue with a focus on new technologies and best practices. H-GAC will continue to develop region-wide resources to ease the burden on local government staff. And we will continue to bring funding opportunities from both internal and external sources to the attention of our local communities.

By working together, H-GAC, local governments, and all people in our communities can make a positive impact on the region and its management of solid waste making the Houston-Galveston region a great place to call home.



