



THE COST OF LITTER & ILLEGAL DUMPING IN TEXAS

A STUDY OF NINE CITIES
ACROSS THE STATE

February 2017

BURNS  MCDONNELL

February 20, 2017

Mr. Kim Mote
Executive Director
Texans For Clean Water
1901 Lexington
Houston, Texas 77098

Re: The Cost of Litter and Illegal Dumping in Texas: A Study of Nine Cities Across the State

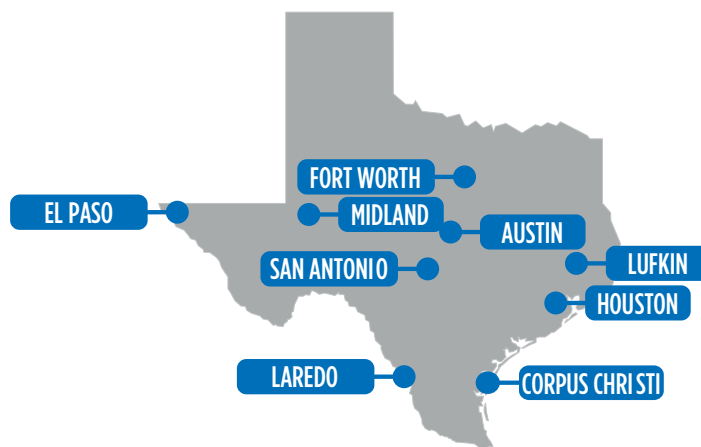
Dear Mr. Mote:

Every day, Texas cities expend significant efforts to address litter and illegal dumping across their communities and waterways. As documented in this Study commissioned by Texans For Clean Water and prepared by Burns & McDonnell, nine cities in Texas spend more than \$50 million annually on prevention, education, abatement, and enforcement efforts.

The purpose of this Study was to document the costs that nine cities in Texas incur to manage litter and illegal dumping. Together, these cities represent more than 25 percent of the state's population.

Regardless of size and geography, each of the nine case study communities spend significant sums annually to prevent, combat, and clean up litter and illegal dumping, and to keep it from ending up in the state's rivers, lakes, bayous, and the Gulf of Mexico. Together, these nine cities spend more than \$50 million annually.

Burns & McDonnell appreciates the opportunity to have partnered with the Texans For Clean Water to develop a study that is intended to serve as a resource for the entire state of Texas. This effort would not have been accomplished without the extensive input and participation by Texans For Clean Water and 175 representatives from the case study cities. Should you have any questions regarding this Study, please contact Scott Pasternak at (512) 872-7141 or spasternak@burnsmcd.com.



Sincerely,

A handwritten signature in black ink, appearing to read "Scott Pasternak".

Scott Pasternak
Senior Project Manager

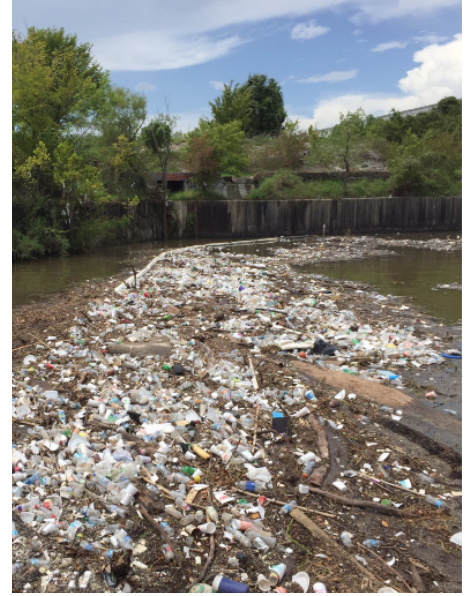
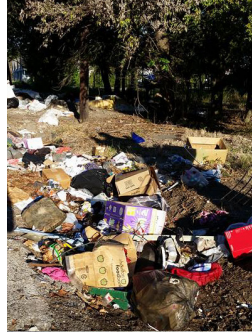


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EXECUTIVE SUMMARY

While we often describe litter and illegal dumping as being ugly or a health concern, less frequently do we think about their cost. Every day, Texas cities expend significant effort to address litter and illegal dumping across their communities and waterways. As documented in this Study commissioned by Texans For Clean Water and prepared by Burns & McDonnell, nine cities in Texas spend more than \$50 million annually on prevention, education, abatement, and enforcement efforts.

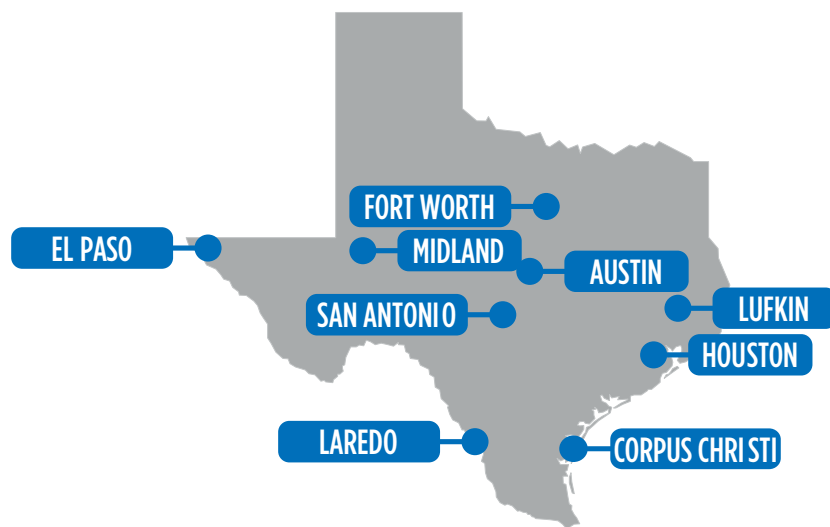
STUDY AT A GLANCE

Purpose: Document the costs incurred by nine cities in Texas to manage litter and illegal dumping. Together, these cities represent more than 25 percent of the state's population.

Participating Communities: Nine cities representing a wide range of population and geographies participated as case studies, as shown on the map.

Research Approach: Through a combination of interviews, extensive data provided by the participating communities, and other available data, Burns & McDonnell documented the annual costs for addressing litter and illegal dumping. The Study only includes actual provided costs and does not make data extrapolations. By erring on the side of caution, the actual average costs and per capita expenses are probably greater than the amounts indicated.

Costs Included: The Study documents program expenditures from local governments, non-governmental organizations, and non-profits for costs associated with prevention, education and outreach, abatement, and enforcement of litter and illegal dumping activities. While the value of volunteer time is excluded from the total costs in the Study, many cities rely on volunteers to help with litter abatement. Where cities provided volunteer information, either hours worked or an estimated value of volunteer time, it is referenced to provide a better understanding of the effort required to abate litter. Expenditures by private businesses are not included in this Study but they are likely significantly more than the costs cited.

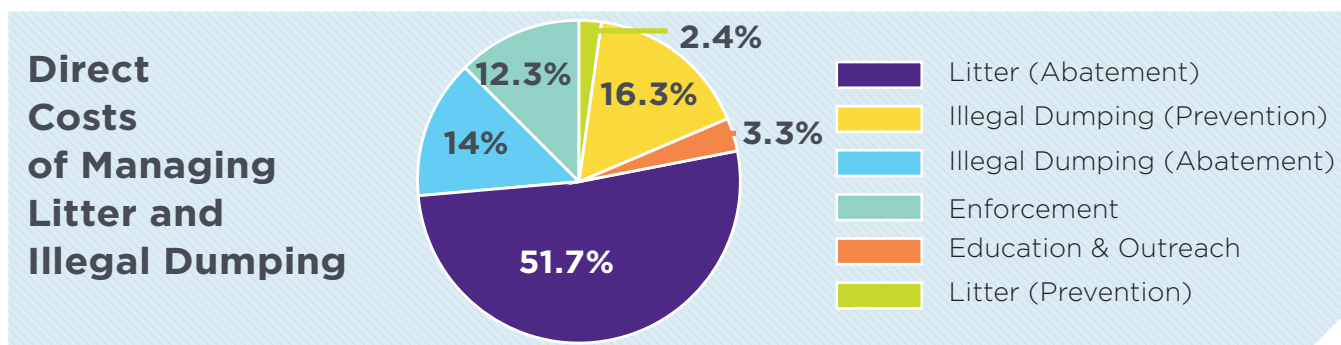


KEY RESULTS

Regardless of size and geography, each of the nine case study cities, which together represented more than 25 percent of the population of Texas, spend significant sums annually to prevent, combat and clean up litter and illegal dumping, and to keep it from ending up in the state's rivers, lakes, bayous, and the Gulf of Mexico. **Together, these nine cities spend more than \$50 million annually.**

CITY	PREVENTION		EDUCATION & OUTREACH	ABATEMENT		ENFORCEMENT	TOTAL	POPULATION
	LITTER	ILLEGAL DUMPING		LITTER	ILLEGAL DUMPING			
Austin	\$ - *	\$14,000*	\$68,000*	\$930,500*	\$1,316,100	\$ - *	\$2,328,600	932,000
Corpus Christi	\$20,000	\$639,600	\$96,100	\$734,200*	\$23,700*	\$177,600*	\$1,691,200	324,000
El Paso	\$ - *	\$2,110,000	\$26,500*	\$1,102,400*	\$1,625,000	\$86,000*	\$4,949,900	681,000
Fort Worth	\$822,200*	\$1,118,200	\$897,100	\$3,392,000*	\$1,257,500	\$1,059,200	\$8,546,200	833,319
Houston	\$250,000*	\$2,200,000	\$200,000	\$13,390,600*	\$617,400*	\$4,462,900*	\$21,120,900	2,296,000
Laredo	\$88,800*	\$ - *	\$134,300	\$4,090,000*	\$5,000*	\$140,000	\$4,458,100	255,000
Lufkin	\$ - *	\$16,600*	\$2,000*	\$149,900*	\$13,700	\$50,600	\$232,800	36,000
Midland	\$ - *	\$139,500	\$10,900	\$122,800*	\$ - *	\$227,000	\$500,200	133,000
San Antonio	\$16,500*	\$1,958,400	\$255,300	\$2,100,000*	\$2,171,000	\$20,200*	\$6,521,400	1,469,800
Total	\$1,197,500	\$8,196,300	\$1,690,200	\$26,012,400	\$7,029,400	\$6,223,500	\$50,349,300	6,960,119

*In some cases, the responding entity did not have complete cost data. An asterisk indicates the entity has a program in place but that the direct cost data was not available for this Study.



DIRECT COSTS OF MANAGING LITTER AND ILLEGAL DUMPING

Here are average costs per city and examples of key activities from the nine case studies.



LITTER
PREVENTION,
AVERAGE COST
\$133,100

To prevent littering, several cities implement a variety of best management practices. Houston provides litter receptacles in its city parks. Cities such as Austin and Laredo have attempted to reduce the number of plastic bags littering the environment by implementing ordinances that limit the use of single-use plastic bags. Fort Worth has multiple programs, including a program working with homeless people to minimize littering.



ILLEGAL
DUMPING
PREVENTION,
AVERAGE COST
\$910,700

Illegal dumping prevention focuses on stopping large items or refuse from being discarded. Several cities – such as Corpus Christi, El Paso, Fort Worth, Houston, Midland, and San Antonio – operate collection facilities where residents can drop off items that may otherwise be illegally dumped.



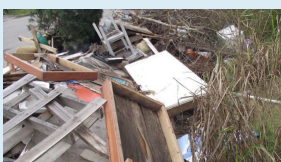
EDUCATION
& OUTREACH,
AVERAGE COST
\$187,800

Education and outreach programs are intended to promote awareness and provide information about legal options for proper disposal or recycling. Many cities and non-governmental organizations provide education programs and curriculum materials to local schools to teach children about the negative effects of litter. Several cities have public outreach campaigns, often managed by stormwater or solid waste management departments. Education and outreach campaigns include traditional materials like brochures, storm drain stenciling, and water or roadway adoption programs, as well as the use of social media and online applications.



LITTER
ABATEMENT,
AVERAGE COST
\$2,890,300

As the highest cost category, substantial sums are expended by all of the case study cities to clean up litter. Many of the cities have programs for street sweeping, litter clean-up events, and city-staffed cleanup programs. As a city with many waterways, Houston incurs extensive costs cleaning up bayous and other waterways.



ILLEGAL
DUMPING
ABATEMENT,
AVERAGE COST
\$781,000

Cleaning up dump sites is important from an environmental perspective, as well as to minimize the potential for more illegal dumping. Austin, El Paso, Fort Worth, Houston, and San Antonio are examples of cities that use staff and specialized equipment (such as boom or grapple trucks) to clean up illegal dump sites and properly dispose of the refuse.



ENFORCEMENT,
AVERAGE COST
\$691,500

Taking legal action against the people responsible for littering and illegally dumping is an important step in changing behavior and minimizing illegal activity. For decades, collaborative efforts in the Houston region have served as an example of a model approach for how multiple governmental entities can work together to enforce illegal dumping crimes.

CASE STUDY

This Study highlights the efforts being undertaken by each of the nine case study cities. Each case study is organized in the same order, based on the categories described in this Executive Summary. Each case study reflects the information provided by a number of city departments, as well as a range of organizations working within the cities on litter and illegal dumping issues, such as counties, river authorities, councils of governments, and Keep Texas Beautiful affiliates. The intent was to develop case studies that capture the key activities being undertaken within a community, and there was a recognition that all of the costs may not fall within the exact boundaries of each city. Costs used in this Study are based on the most recently available data from 2015 or 2016. With regard to allocating costs to the various categories, in some cases, the cities provided varying levels of detail regarding how they divided costs. For example, Fort Worth provided the most detailed understanding of its costs across the categories. Recognizing the varying levels of detail provided by each city or organization, all costs are rounded to the nearest \$100.

Prior to conducting the case studies, each city was invited to participate in the project. During the project, multiple representatives from each city participated in interviews, provided data, and reviewed the draft case studies. In some cases, Burns & McDonnell used existing data from prior financial studies completed on behalf of some of the cities. **Several cities also identified programs focused on addressing litter and illegal dumping, but did not have cost data. For these cities, descriptions have been included without cost data and are noted in the tables and text with an asterisk.**

Alternative Revenues

Many of the case study cities identified alternative sources of revenue that help to offset the cost of litter and illegal dumping prevention and abatement activities. Alternative revenues are highlighted in the case study for each of the following cities:

- Austin
- Corpus Christi
- El Paso
- Fort Worth
- Houston
- Laredo
- Midland
- San Antonio

CONCLUSION

A diverse set of governmental agencies and non-profit organizations are very focused on litter and illegal dumping abatement and enforcement, yet given the extensive efforts to provide convenient alternatives to illegal dumping, communities continue to search for solutions to better prevent litter and illegal dumping. While critical to appreciate the amounts that are being expended by these nine cities to address litter and illegal dumping, it is additionally important to understand how these funds are spent. **Nearly 80 percent of costs are incurred on abatement and enforcement efforts, which places cities in a reactionary mode.** Development of more effective prevention programs and management practices may necessitate additional state coordination.

This Study focused on nine cities that represent diverse geography, populations, and local engagement on the issues of litter and illegal dumping. Consequently, the findings are likely applicable to many other communities in the state. Although economic data is mostly available at the municipal level, it is important to understand that this is a costly issue for other local, regional, and state governmental entities as well as non-profit organizations and private businesses, which all share the costs, consequences, and impacts of litter and illegal dumping.

AUSTIN: THE CAPITOL CITY

The Colorado River system is a central feature to the City of Austin (City). Access to an abundant, reliable, and clean source of water played a key role in the original decision in 1835 to locate the City just downstream of Barton Springs along the Colorado River (Lady Bird Lake near downtown Austin) and to select it as the state's capital in 1839. Austin's water features continue to be the source of intense pride for its residents and a powerful magnet for visitors, new residents, and businesses.

However, flash flooding caused by rain events like the five 400-plus year storms that hit Austin in 2015 and 2016 funneled trash and debris from the creek system into Lady Bird Lake. Each year, City staff and volunteers pull 250 tons of trash from Lady Bird Lake (in addition to the 6,500 tons removed annually from Austin streets).

Cost Summary

ACTIVITY	LITTER	ILLEGAL DUMPING
Prevention	\$ - *	\$14,000*
Education and Outreach	\$68,000*	
Abatement	\$930,500*	\$1,316,100
Enforcement	\$ - *	
2015 Litter & Illegal Dumping Costs	\$2,328,600	

ALTERNATIVE REVENUES

The Clean Community Fee is an \$8.05 monthly fee that residents pay, including single-family homes and apartment and condo dwellers, and a \$19.85 monthly fee that commercial properties pay for services that keep Austin clean. In 2016, the City collected \$20,100,000 from the Clean Community Fee. The funds are distributed across programs in the Austin Resource Recovery Department (ARR) and Austin Code Department (Code) such as street and boulevard sweeping, litter abatement, and illegal dumping cameras.

Key Takeaways

- The Clean Community Fee is a significant source of revenue for the City to distribute across litter and illegal dumping programs.
- The Austin Code Department (Code) enforcement is limited in their effort to combat illegal dumping by the lack of authority to pull over vehicles.
- The City of Austin believes the Single-use Carryout Bag Ordinance has reduced the number of plastic bags littering the community.

*In some cases, the responding entity did not have complete cost data. An asterisk indicates the entity has a program in place but that the direct cost data was not available for this Study.

PREVENTION

The ARR Department has a “What Do I Do With” search engine¹ on its website that allows a user to enter a waste item (e.g., furniture, electronics, and yard trimmings) and the search engine lists disposal alternatives offered in Austin by ARR and other entities. Additionally, residents can use the “My Schedule” application to get a personalized collection calendar for all residential curbside services. Residents can download their collection schedule to a personal calendar or sign up for text, email, or phone call reminders of their collection days and special bulk pickups. These services cost \$14,000 annually.

The ARR Recycling and Reuse Drop-Off Center offers Austin and Travis County residents the ability to dispose of electronics and large and small appliances for free.*

City officials estimated that Austin residents used 263 million plastic bags per year prior to 2013 when the City implemented the Single-use Carryout Bag Ordinance, commonly known as the “bag ban.” The ordinance prevents the use of plastic bags thinner than 4 mils, which includes most common shopping bags, except in limited cases where necessary to prevent moisture damage. Businesses within the City are required to provide reusable bags with handles, such as paper or thicker plastic bags.

Fast Facts

Location: Central Texas

Population: 932,000

Waterways:

- Colorado River
- Lady Bird Lake
- Lake Austin
- Lake Travis
- Barton Creek
- Boggy Creek
- Bull Creek
- Onion Creek
- Shoal Creek
- Slaughter Creek
- Waller Creek
- Williamson Creek
- Walnut Creek
- Walter Long Lake

Annual Precipitation: 34.5 inches

Sad Couch

In 2015, Code created a social media campaign to raise awareness of illegal dumping in student housing areas adjacent to the University of Texas by introducing “Sad Couch,” a disheartened couch that has been illegally dumped. This character “travels” around West Campus to different locations where trash, debris, furniture, and other bulk items have been dumped improperly. Sad Couch provides education to the public by engaging on Twitter (@SadCouchATX) and Facebook, and giving tips on how to dispose of trash and debris correctly.

¹<http://www.austintexas.gov/what-do-i-do>

EDUCATION & OUTREACH

Keep Austin Beautiful (KAB), in partnership with the Watershed Protection Department (Watershed), sponsors Clean Creek Campus, an education program that engages third through eighth graders in hands-on, standards-aligned activities connecting classroom learning with on-the-ground service projects that focus on protecting water quality. Service projects include students learning how to conduct a litter audit and cleanup and a 3-hour service learning field trip to a local creek or park during which students rotate through stations emphasizing creek restoration and water quality. Participating schools also receive two in-class lessons focused on watersheds, litter, pervious and impervious ground cover, and the importance of healthy soil. Clean Creek Campus programming for the 2016-2017 school year is full.*

Key Organizations

- City of Austin
 - Austin Resource Recovery Department (ARR)
 - Code Department (Code)
 - Parks and Recreation Department (PARD)
 - Watershed Protection Department (Watershed)
- Keep Austin Beautiful (KAB)

With funding from ARR, Watershed spent \$68,000 in 2015 on anti-litter campaigns such as “Let’s Can It!” and associated advertisements.

The Code Community Volunteers partner with Code by acting as neighborhood liaisons, providing education on city codes to their neighbors, and participating in community cleanups and other events. Code also offers Code Speakers, a program where Code Compliance officers give presentations to community and civic organizations on city ordinances.*



Installed public art made from litter collected along Austin creeks

ABATEMENT: LITTER

The City of Austin removes litter from the community through a variety of departments and KAB.

ORGANIZATION	DESCRIPTION
Austin Resource Recovery (ARR)	Nightly street sweeps of designated streets in the downtown Central Business District. This litter clean -up service costs the City \$477,100 in 2015.
Parks and Recreation (PARC)	Provides 100 maintenance personnel who spend half of their time picking up litter in parks. These personnel are supplemented with temporary staff during peak periods. The 2015 PARC budget for these services was \$150,000, including staff and temporary staff pay. Sponsors, "It's My Park Day!", in partnership with the Austin Parks Foundation, in the Spring and Fall where volunteers cleanup local parks.* Sponsors an Adopt-a-Park Program, in partnership with the Austin Parks Foundation, to create neighborhood ownership of parks.*
Watershed Protection Department (Watershed)	Operates a barge to remove litter and debris from Lady Bird Lake on a daily basis. Installed and maintains hard booms at all major influent points. KAB, in partnership with Watershed, organizes Rapid Rain Responders, a team of volunteers with watercraft to clean up litter in Lady Bird Lake after large rain events. KAB sends out notification emails when volunteers are needed.*
Keep Austin Beautiful (KAB)	In partnership with Watershed, KAB oversees an Adopt-a-Creek program where groups adopt a ¼-mile segment of waterway to reduce the amount of trash entering creeks, improve water quality, and restore riparian habitats. Adopters are required to conduct at least four cleanups per year for a minimum of two years. KAB also sponsors large-scale bi-monthly clean-ups of Lady Bird Lake. Similar to the Adopt-a-Creek program is KAB's Adopt-a-Street program. Groups are responsible for at least four cleanups along a ½-mile stretch of roadway for one year. Signage is placed along the segment recognizing the volunteer group. KAB hosts Clean Sweep, a city-wide service day spanning more than 130 sites in 31 zip codes throughout Austin. In 2015, over 29 tons of trash were removed by more than 4,000 volunteers who contributed 8,700 combined service hours. Clean Sweep is followed by a Volunteer Appreciation Party. Supplies numerous community clean-up activities sponsored and unsponsored by KAB. In 2015, KAB spent \$303,400 in direct costs to host these cleanup programs. While excluded from the cost totals in this Study, KAB received \$120,100 in in-kind donations.

ABATEMENT: ILLEGAL DUMPING

Seven days per week, ARR has about 30 crews containing a grapple truck and rear loader that respond to illegal dumping in City rights-of-way and other properties. These crews cost ARR \$1,066,100 annually to operate. One of their responsibilities is to respond to one illegal dump site and one homeless camp per month at Austin parks reported by PARD.

According to the City, Code spends over \$250,000 per year on contractor costs to remediate illegal dumping sites.

Austin Materials Marketplace

A local online marketplace for commercial transactions of items that have the potential to be illegally dumped, Austin Materials Marketplace connects businesses seeking to divert unwanted items, such as furniture and other commercial materials, with business needing those items.

Source: <http://austinmaterialsmarketplace.org/>

ENFORCEMENT

Through authority provided by the Texas Water Code, the Watershed Protection Department is able to patrol creek banks and require property owners to clean up litter and illegal dumping on their property to prevent it from reaching the waterways. The property owners are required to clean up the debris even if it was transported from another location during a rain event.

With privatized waste hauling (hauler-for-hire) services, the City has had problems ensuring haulers correctly dispose of their waste instead of illegally dumping the material. In response, Code has three compliance officers who exclusively oversee the hauler-for-hire program. Code reports one limitation is the lack of authority to pull over vehicles; they must rely on the Austin Police Department (APD).

Code pursues two goals with illegal dumping – ensuring the dump site is cleaned up and catching the violator. Code has installed and monitors over 30 cameras in known illegal dumping areas to document the illegal activities. In addition to the cameras, Code relies on calls to 311. If caught, offenders may be required to clean up the dump site and pay a fine up to \$2,000. When Code issues illegal dumping citations, the cases are sent to an administrative panel appointed by the City Council to hear cases. Violators are typically given 10 days to clean up the property before fines are levied. Two Code officers are responsible for illegal dumping. However, cleaning up the dump site is ultimately the responsibility of the property owner.*



Austin youth participating in KAB's Clean Sweep

CORPUS CHRISTI: SPARKLING CITY BY THE SEA

The City of Corpus Christi (City) prides itself on its beaches and bayfront. Its tourism industry relies on water-based attractions such as the USS Lexington, the Texas State Aquarium, and beaches on Corpus Christi Bay and Padre and Mustang Islands. Corpus Christi is home to the Port of Corpus Christi on the Nueces River Delta, the fifth largest port in the nation, with an expansive petrochemical industry presence. Recognizing the attractive nature of Corpus Christi's water resources, Texas A&M sited its Corpus Christi campus on Ward Island in Oso Bay.

Regular high winds and disregard by some residents to proper disposal contribute to challenging conditions for the City and its partners to keep Corpus Christi free of litter and illegal dumping. In response, the City continues to implement an aggressive education and outreach campaign across multiple departments to combat litter and illegal dumping.

Cost Summary

ACTIVITY	LITTER	ILLEGAL DUMPING
Prevention	\$20,000	\$639,600
Education and Outreach	\$96,100	
Abatement	\$734,200*	\$23,700*
Enforcement	\$177,600*	
2015 Litter & Illegal Dumping Costs	\$1,691,200	

ALTERNATIVE REVENUES

Customers are charged \$0.25 per month for recycling and anti-litter campaigns on the utility bill. This provides an additional \$250,000 per year to the Solid Waste Services Department (SWSD). Another source of alternative revenue at approximately \$400,000 per year is generated by violations of heavy brush set outs. The City charges \$75.00 for customers who fail to meet the set out schedule.

Key Takeaways

- The Corpus Christi Marina continues to struggle with stormwater outfalls that release substantial amounts of litter into Corpus Christi Bay even with multiple anti-litter campaigns.
- In lieu of an illegal dumping ordinance, code officers have the authority to issue citations through a solid waste improper set out ordinance. Five Parks and Recreation Department (PRD) code enforcement officers spend approximately 10 percent of their time educating and citing for litter and illegal dumping.

*In some cases, the responding entity did not have complete cost data. An asterisk indicates the entity has a program in place but that the direct cost data was not available for this Study.

PREVENTION

The J.C. Elliot Collection Center is a neighborhood drop off center where at no charge residents may dispose of household hazardous waste, household garbage and refuse (i.e., mattresses, clothes, and furniture), large household appliances, household brush, and non-commercial construction and demolition materials (excluding dirt, rock, concrete, and brick). This service aids in the prevention of illegal dumping according to City staff. In 2015, the J.C. Elliot Collection Center cost the City \$534,200.

The SWSD offers “Litter Critter” services where two or more neighbors can request a large brush collection truck to dispose of brush and small household items. This on-call service at no cost to the customer is a proactive approach to keep brush and debris from building up on private properties and rights-of-way. “Litter Critter” equipment and personnel time cost the City \$22,900 in 2015. Also, SWSD provides free bi-monthly roll off services to Padre Island residents to keep the beaches clean, in addition to their residential subscription. This free service to Island residents costs the City \$82,500 in collection and disposal costs.

An effective litter prevention strategy has been the Parks and Recreation Department (PRD) distribution at local beaches of mesh yellow trash bags with “Don’t Litter” across the bag. The yellow bags are handed out to visitors as they enter the beach and are available at kiosks along the beach. Since its inception in 2015, PRD staff have noticed a significant reduction of litter on Corpus Christi beaches, especially over Spring Break. Annually, this program costs PRD \$20,000.

Fast Facts

Location: Texas Coastal Bend

Population: 324,000

Waterways:

- Nueces Bay
- Nueces River
- Oso Bay
- Oso Creek
- Corpus Christi Bay
- Laguna Madre
- Barney Davis Reservoir

Annual Precipitation: 31.8 inches



Yellow trash bag kiosk at the beach



J.C. Elliot Collection Center

EDUCATION & OUTREACH

SWSD spent \$500,000 on the “Leave It Better than you Found It” campaign in 2010. Seeking to improve from the 2010 results, SWSD is in the process of developing a new anti-litter campaign for 2017. SWSD currently employs two full-time Stormwater “Keep it Clean!” Campaign employees to coordinate the campaigns and educate local school children with mascots, like Picky Pete the pelican. The Picky Pete program rewards students for picking up litter. The SWSD education and outreach program cost the City \$40,000 in 2015.

Over 18,300 stormwater inlets drain into Corpus Christi Bay, so the Stormwater Utility Department (SUD) has an active “Keep It Clean!” education and outreach campaign that spends \$50,000 per year on billboards, school presentations and demonstrations, outreach events, giveaways, and stencils on drains.

Key Organizations

- City of Corpus Christi
 - Code Enforcement
 - Marina
 - Parks and Recreation (PRD)
 - Police Department (CCPD)
 - Solid Waste Services (SWSD)
 - Stormwater Utilities Department (SUD)
- Beautify Corpus Christi Association (BCCA)
- Port of Corpus Christi



Stormwater “Keep it Clean!” Campaign

My Waste App

The My Waste Application (App) provides a service collection schedule customized by service zone. This app helps customers plan their set outs with the goal of reducing the amount of time trash and recyclables are left curbside. The App costs the City \$3,700 per year.

Community Storm Drain Support

The Stormwater Stenciling Program, which began in 1992, promotes ownership of stormwater inlets by allowing volunteers to place stencils on inlets and then teaches volunteers how to inspect inlets and distribute educational material in their neighborhood. This program cost the City \$2,400 in 2015.

ABATEMENT: LITTER

The City and partnering organizations remove litter from the community through a variety of activities.

ORGANIZATION	DESCRIPTION
City of Corpus Christi - Solid Waste Services Department (SWSD)	During the annual BucDays parade, staff handed out \$2,500 in trash bags to spectators and spent \$17,900 for post-parade litter cleanup in 2015.
City of Corpus Christi - Parks and Recreation (PRD)	Beach, neighborhood, and downtown park maintenance to address trash and disposal costs the City approximately \$178,600 per year.
City of Corpus Christi - Stormwater Utility Department (SUD)	Performs regular sweeping of city streets at an annual cost of \$285,200.
Marina	The marina spends \$250,000 per year on litter abatement. After heavy rains in 2015, 10 to 12 marina maintenance staff worked 8-hour shifts nonstop for 7 days to remove approximately 14 tons of litter and debris that flowed into the Bay from stormwater outfalls.
Beautify Corpus Christi Association (BCCA)	Among Adopt-a Beach, the Great American Cleanup, and Don't Mess with Texas Trash-Off, BCCA-led events removed 20,000 pounds of litter from the City. BCCA also facilitates cleanups for smaller groups and supplies cleanup materials.*
Port of Corpus Christi	With new port leadership focused on improving aesthetics, there is a renewed effort by Port maintenance crews to keep the grounds free of litter within the Port.*



Stormwater Department crew cleaning a storm drain



Litter along the seawall in the marina

ABATEMENT: ILLEGAL DUMPING

When illegal dumping is reported by a 311 work order or SWSD code officer (see Enforcement), brush collection crews are diverted from their route to remediate the site. These two-person crews are equipped with a rear-steer loader and a dump truck or a grapple truck. The SWSD estimates that diverting their brush collection crews to abate illegal dumping sites costs the City \$23,700 in 2015.

Beaches are a frequent location for illegal dumping sites. The Police Department (CCPD) Code Enforcement Division administers an annual contract with a local abatement business to clean up illegal dump sites on the beaches.*



SWSD Brush/Illegal Dumping Collection - rear-steer loader and dump truck

ENFORCEMENT

The City divides code enforcement responsibilities among three departments: SWSD, PRD, and CCPD. SWSD Code has authority over City rights-of-way, PRD oversees the beaches and parks, while CCPD's Code Enforcement Division enforces ordinances on private property.* SWSD Code and PRD identified that they spent \$177,600 on personnel and vehicle costs in 2015.

SWSD has two solid waste compliance officers who work full time to educate the community on nuisance ordinances before issuing notices or warnings. In lieu of an illegal dumping ordinance, code officers have the authority to issue citations through a solid waste improper set out ordinance. Five PRD code enforcement officers spend approximately 10 percent of their time educating and citing for litter and illegal dumping. CCPD Code Enforcement Division employs 18 code officers who spend approximately 30 percent of their time enforcing litter and illegal dumping ordinances. Using social media, CCPD Code Enforcement posts photos of illegal dumping sites to solicit information from the public.

EL PASO: THE SUN CITY

The City of El Paso (City) is connected to its waterways even though it is in a desert locale. Separating El Paso and Ciudad Juarez, the Rio Grande River forms a natural international boundary that runs between Texas and Mexico and empties into the Gulf of Mexico. The Rio Grande River has significant economic importance with numerous international bridge crossings servicing the second largest Foreign Trade Zone by volume in the United States.¹ The City relies on a drainage system of arroyos as a vital part of its stormwater conveyance and retention system. Some arroyos are also central features of municipal parks (e.g., Billy Rogers Arroyo Park). Open irrigation canals traverse parts of the City to provide water for local crop production.

The City is unique in that sparse vegetation from its desert climate allows for visible litter and illegal dumping to stand out. Litter typically migrates to arroyos and ultimately to the Rio Grande River.

Cost Summary

ACTIVITY	LITTER	ILLEGAL DUMPING
Prevention	\$-*	\$2,110,000
Education and Outreach	\$26,500*	
Abatement	\$1,102,400*	\$1,625,000
Enforcement	\$86,000*	
2015 Litter & Illegal Dumping Costs	\$4,949,900	

ALTERNATIVE REVENUES

The City collects a monthly environmental fee (\$5.00 per residential customer and \$15.00 per commercial customer) that is included in customer refuse bills. The environmental fee funds the Streets and Maintenance Department's cleanup of downtown areas managed by the Downtown Management District, specifically alley cleanups, and other solid waste management services such as the City's illegal dumping site cleanups. At the landfill, haulers delivering unsecured loads are charged an additional \$5.00 per load.

The El Paso Water Utility (EPWU) charges a monthly stormwater fee ranging between \$1.79 and \$7.13 per residential customer that is assessed on the monthly water bill. EPWU brought in approximately \$16,000,000 in 2015 with a quarter of the revenue for stormwater maintenance. A portion of the stormwater maintenance revenue is allocated for litter and illegal dumping cleanup.

Key Takeaways

- The El Paso Water Improvement District # 1 (EP WID #1) collected 10,000 illegally dumped tires within the City in 2015.
- Daily migration across the US-Mexico border contributes to the challenge of communicating an anti-litter and illegal dumping message.
- Even with strategically placed trash cans, the Parks and Recreation Department (PRD) reports litter still has to be picked up at an annual cost of \$726,000.
- Even with increased levels of prosecution, the El Paso County Attorney's Office Environmental Crime Unit (ECU) does not believe the incidence rate of litter and illegal dumping is decreasing in the County.

*In some cases, the responding entity did not have complete cost data. An asterisk indicates the entity has a program in place but that the direct cost data was not available for this Study.

¹ El Paso Chamber of Commerce

PREVENTION

The City's Environmental Services Department (ESD) operates four Citizen Collection Stations (CCS) strategically located across the City. The CCS accept tires, electronics (including TVs and computers), bulky items, and yard waste at no cost to City residents who pay monthly solid waste fees. According to ESD staff, the CCS have significantly reduced illegal dumping in the City. The CCS cost the City \$2,100,000 in 2015.

The El Paso Water Improvement District #1 (EP WID #1) operates a system of irrigation canals—some of which run through the City. Illegal dumping of tires is an issue for those canals and EP WID #1 offers two to three tire amnesty collection events per year. In 2015, the EP WID #1 collected approximately 10,000 tires from the events inside the city limits at a cost of \$10,000.

Fast Facts

Location: Far West Texas

Population: 681,000

Waterways:

- Rio Grande River
- Mulberry and Thorn Reservoirs (seasonal)
- Ascarate Lake
- Numerous unnamed arroyos
- Irrigation channels

Annual Precipitation: 9.8 inches

EDUCATION & OUTREACH

The effectiveness of education and outreach can be difficult with a large transient population. Fluctuating populations at Fort Bliss and daily migration across the US-Mexico border contribute to the challenge of communicating an anti-litter and illegal dumping message.

The U.S. International Boundary and Water Commission (USIBWC), headquartered in El Paso, administers the Texas Clean Rivers program, which aims to improve surface water quality within the Texas portion of the Rio Grande River Basin. The USIBWC supports the Texas Clean Rivers Program by informing and engaging stakeholders through public information and education activities, including providing educational material to children in local schools. The USIBWC estimates that it spent \$21,400 in 2015 on Texas Clean Rivers program.



ESD Citizen Collection Station – grapple truck operating on the left

During busy holidays, the Parks and Recreation Department (PRD) works with the City's marketing staff to develop press releases and coordinate TV interviews on local news stations to educate the community about keeping El Paso parks clean.* According to PRD staff, the education and outreach has been successful, and litter has decreased in City parks during the peak visitation periods.

From 2010-2011, the EPWU led a \$40,000 campaign against illegal dumping called "Get Mad!" where EPWU paid for billboard advertising and other public service announcements

with an “angry grandmother theme.” The EPWU public information officer spends approximately five percent of her time educating the public on the impact of litter and illegal dumping into the stormwater system. In 2015, EPWU spent \$2,700 on education and outreach.

With an all-volunteer staff, Keep El Paso Beautiful (KEPB) focuses its efforts on empowering community groups to lead litter cleanup events. In addition to community tool sheds across the City (see Abatement: Litter), KEPB has a comprehensive website where citizens can learn how to report environmental crimes, lead cleanup events, and obtain contact information for other litter and illegal dumping questions. Managing the webpage cost KEPB \$2,400 in 2015.



EPWU’s Illegal Dumping Campaign

ABATEMENT: LITTER

The City removes litter from the community through a variety of departments and KEPB.

ORGANIZATION	DESCRIPTION
City of El Paso - Parks and Recreation (PRD)	Litter abatement at parks is performed by a contractor at an annual cost to the City of \$726,000. Even with strategically placed trash cans, PRD staff report that they have to pick up litter. Plastic bottles from athletic events are the most common item picked up.
City of El Paso - Streets and Maintenance	Contracts supplemental labor to clean alley ways at an annual cost of \$366,400.
City of El Paso - Water Utility (EPWU)	A crew of 40 staff spends approximately 15 percent of their time maintaining stormwater drains, channels, and other waterways.*
Keep El Paso Beautiful (KEPB)	Maintains 30 community tool sheds in partnership with the El Paso Fire Department where residents can access free litter grabbers, gloves, and trash bags for cleanup events. Supplying these tool sheds cost KEPB \$10,000 in 2015.



KEPB Community Tool Shed

ABATEMENT: ILLEGAL DUMPING

The City and its local partners report that the majority of illegal dumping activities occur in unincorporated areas outside the city limits, but that illegal dumping within the City often occurs in waterways (e.g., irrigation channels, arroyos, and stormwater retention basins). The primary items illegally dumped in the City are tires, mattresses, sofa sets, and yard waste.

According to ESD staff, the special collections crew that normally provides on-demand curbside brush and bulky collections typically spends 10 percent of its time cleaning up illegal dump sites. Work orders generated by citizen reports to 311 or code enforcement direct the crew to illegal dumping sites; however, the crew also cleans up illegal dump sites discovered while traveling within the City. The ESD estimates that diverting the special collections crew from their regular routes cost the City \$1,600,000 in 2015.

Along with windblown litter, the City experiences illegal dumping around its landfill. As a result, ESD deploys two crews of two staff to police a 2-mile radius from the landfill perimeter for 2.5 hours daily, collecting litter and illegally dumped material. The crews typically fill three 30-cubic yard roll-offs per week. Landfill staff report that "No illegal dumping" signage has reduced the amount of illegal dumping in the area. These efforts cost ESD \$25,000 annually.

ENFORCEMENT

Within ESD, code compliance officers respond to complaints reported to 311. Code enforcement officers are deployed to the identified properties. ESD estimates that code officers enforcing illegal dumping ordinances costs the department \$52,900 per year. The officers inspect the property then call the ESD special collections crew to remove the illegally dumped material when appropriate. Presently, code enforcement officers are unable to write citations for littering or illegal dumping and must wait for an El Paso Police officer to arrive to write a citation.

Within the El Paso County Attorney's Office is the Environmental Crime Unit (ECU). With the cooperation of local and Federal law enforcement agencies, the ECU's full-time environmental prosecutor prosecutes polluters engaged in illegal dumping, trash burning, and other misdemeanor environmental crimes.² Prosecution costs, approximately \$33,100 in 2015, span from sheriff's deputies' salaries to jury fees to the Public Works Department that provides maps to be used as evidence during trials. Even with increased levels of prosecution, ECU does not believe the County is experiencing decreased levels of litter and illegal dumping.

² <http://www.epcounty.com/CA/environment.htm>

FORT WORTH: WHERE THE WEST BEGINS

As the 16th largest city in the country and fifth largest in Texas, Fort Worth is segmented by the Clear and West Forks of the Trinity River that converge between downtown and the historic Stockyards. A popular destination in Fort Worth is the Trinity River Trails, a recreational hub-and-spoke trail system that lines the banks of the Clear and West Forks. Recently land adjacent to the Trinity River Trails has become popular for local development.

In 2015, the City of Fort Worth (City) recognized that mitigation of litter and illegal dumping is a challenge in Fort Worth. The City hosted a Litter Summit in early 2016 with stakeholders from the City, non-governmental organizations, businesses, and other community organizations to coordinate litter and illegal dumping efforts. As of August 2016, the Environmental Management Division within the Code Compliance Department developed the City's 5-Year Litter Management Plan. Input from the Litter Summit helped to inform litter prevention actions included in the City's Litter Management Plan to be implemented by stakeholders. The City is also planning to host additional Litter Summit sessions.

Cost Summary

ACTIVITY	LITTER	ILLEGAL DUMPING
Prevention	\$822,200*	\$1,118,200
Education and Outreach	\$897,100	
Abatement	\$3,392,000*	\$1,257,500
Enforcement	\$1,059,200	
2015 Litter & Illegal Dumping Costs	\$8,546,200	

The City provided a detailed analysis of the individual program costs. In some cases, the City allocated the cost of an individual program across multiple categories. For example, a program that is primarily targeted at litter prevention may also have an education and outreach component; therefore, the City allocated a portion of its cost to litter prevention and education and outreach. Within this case study the total cost of a particular program is reported in the activity section for which the City allocated the highest percentage of the cost. Programs with costs allocated to more than one category are identified by a "+". The total costs in the Cost Summary are allocated based on the allocated cost summary table at the end of this case study.

ALTERNATIVE REVENUES

Property owners within the Downtown Fort Worth Inc. (DFWI) PID #1 pay a special assessment rate on their taxes (\$0.10 for every \$100.00 in value). For example, a \$35 million commercial high-rise will pay \$35,000 annually into the PID. A portion of this special assessment is allocated to litter abatement.

The North Texas Tollway Authority (NTTA) signage and roadway litter abatement contract is funded by NTTA's operating fund, which is funded directly by toll revenues.

To fund stormwater inlet maintenance and other stormwater maintenance services, the City charges a stormwater utility fee to residential and commercial properties. The fee is based on

*In some cases, the responding entity did not have complete cost data. An asterisk indicates the entity has a program in place but that the direct cost data was not available for this Study.

the amount of impermeable cover on the property and ranges from \$2.70 to \$10.80 for residential property. The fee is based on impermeable surface area for commercial properties (\$5.40 for every 2,600 square feet of impermeable surface).

In addition to the stormwater utility fee, the City charges a monthly environmental fund fee ranging from \$0.50 for apartment customers to \$35 for industrial customers. A portion of that revenue is allocated to the Environmental Management Division's floatable litter abatement efforts to maintain compliance with their sewer/stormwater permit.

Fast Facts

Location: North Central Texas

Population: 833,000

Waterways:

- Clear Fork of the Trinity River
- Benbrook Lake
- Mary's Creek
- Lake Worth
- Eagle Mountain Lake
- West Fork of the Trinity River
- Marine Creek
- Marine Creek Reservoir
- Lake Arlington
- Trinity River
- Sycamore Creek
- Big and Little Fossil Creeks

Annual Precipitation: 35.8 inches

Key Takeaways

- Solid Waste Services (SWS) Division reports that it removed 2,800 tons of debris from illegal dump sites from July 2014 to July 2015. The number of SWS staff has decreased in the last 20 years and the number of illegal dumping sites has increased.
- In 2015, litter and illegal dumping violations were the third highest on record at 750 violations per month.
- The City's Stormwater Management Division offers a stormwater utility fee credit for non-residential property owners that implement best management practices.

Credits for Cleanliness

The Stormwater Management Division offers a stormwater utility fee credit for non-residential property owners that implement best management practices, which includes implementation of stormwater educational curricula. Stormwater utility fee credits worth about \$93,700* were awarded during fiscal year 2015 (10/1/2014 – 9/30/2015). These costs do not include administrative costs. Additionally, a non-residential property owner can receive a 5 percent credit off the Stormwater Utility fee for one year after conducting a litter cleanup event. The Adopt-a-Creek credit is not a significant part of stormwater utility fee credits. In FY 2015 it was \$1,400.

PREVENTION

The City offers three free drop-off stations across Fort Worth for its residents, and plans to open a fourth location in 2017. Customers can dispose of items such as tires, yard trimmings, old furniture, appliances, electronics, and extra household garbage, items that are commonly illegally dumped. The City is currently replacing the underused “Swap Shop” area of each drop-off station with an attended donation center that will help expand the type and volume of materials diverted from illegal dumping and landfill disposal, to be reused by others. The City estimates these litter prevention services cost the City \$1,357,600+ annually.

Alternative Approach

The Fort Worth Police Department has an informal arrangement with the homeless community whereby, in lieu of a ticket, the police distribute free grey trash bags at homeless campsites to promote cleanliness and prevent litter. Staffing and supplies cost the Police Department \$1,800 per year.

Along the Chisholm Trail Parkway, the NTTA placed several “Litter Costs You Money” signs. The NTTA signage costs are negligible.

The Fort Worth Police Department spends \$1,800 per year to provide trash bags for the homeless to help prevent litter accumulation on city streets.

EDUCATION & OUTREACH

The City conducts an anti-litter campaign called “Still Littering - Seriously?” with banners promoting this message at the City’s three drop-off stations, on banners on city trailers, and on postcards. Giveaways such as pocket ashtrays and car litter bags passed out at community and neighborhood events help reemphasize the anti-litter message. Additionally, the City of Fort Worth Community Engagement Office conducts six different programs including: Captain Crud and the Cruddies, What’s Wrong with this Picture?, Freddie the Fish, Recycle Right, and Captain Crud and the Buddies that include a litter prevention message. Keep Fort Worth Beautiful (KFWB) staff and board members promote no littering during presentations for career days to school-aged students, tables at community events and other speaking engagements to groups such as Rotary Club and neighborhood associations.

Additionally, KFWB provides materials for litter education events and promotes litter-related news stories in local media to raise awareness of the impact of litter within the community. KFWB spent approximately \$10,000 on these efforts in 2015.



Ten on Tuesday logo

The City of Fort Worth engages residents to embrace a non-littering life style through financial support of the Tarrant Regional Water District (TRWD) Reverse Litter Program and by cross-promoting messages on the City and KFWB websites and social media channels. The TRWD, responsible for managing Tarrant County’s flood control system, sponsors, along with the cities of Dallas, Fort Worth, and Denton, a Metroplex-wide litter abatement campaign. “Ten on Tuesday” encourages businesses, schools, community groups, and individuals to reverse litter by picking up ten pieces of trash and recyclable materials each Tuesday. As of January 2017, the campaign website reported nearly 23,000 “Ten on Tuesday” pledges. This campaign costs TRWD \$400,000+ per year, plus additional funds from community partners, including \$200,000+ from the City of Fort Worth.

Additional TRWD educational and outreach programs include Adopt-a-River and Adopt-a-Drain that cost TRWD \$25,200+ annually. Adopt-a-River allows groups to adopt and clean a designated section of the Trinity River while Adopt-a-Drain provides groups with storm drain awareness placards installed at a location of their choice. In return, the Adopt-a-Drain sponsors are responsible for keeping the exterior of the drain free of litter and debris. The City of Fort Worth also provides various anti-litter education through stormwater quality, recycling, and other environmentally-conscious education campaigns and outreach projects.

Social media is integral in the TRWD outreach process of all the aforementioned TRWD programs from advertising and promotion to storytelling through digital interaction. Channels like Facebook, Twitter, and Instagram help TRWD connect these programs with citizens interested in an environmentally conscious lifestyle. TRWD spent \$1,500 in 2015 in social media advertisements.

ABATEMENT: LITTER

The City and partnering organizations remove litter from the community through a variety of activities.

ORGANIZATION	DESCRIPTION
City of Fort Worth - Solid Waste Services (SWS) Division	Five litter abatement crews of five SWS employees work weekdays picking up litter in City rights-of-way. Historically, the courts have supplemented these crews with community service sentences plus a team of five illegal dump investigators; however the courts are shifting towards fines. These crews cost the City \$1,100,000+ per year in salaries, vehicles, and equipment.
City of Fort Worth - Transportation & Public Works Department	Stormwater maintenance crews regularly clean the City's 36,000 storm drains and accompanying infrastructure, which includes vegetated conveyances (non-street) and culverted street crossings. Litter removal costs the department \$777,400+ per year.
Keep Fort Worth Beautiful (KFWB)	Coordinates and hosts two citywide cleanup events: one in the spring (Cowtown Cleanup) and one in the fall (Neighborhood Litter Stomp). These events will often occur on the same days as TRWD's Trinity River Trash Bash. TRWD focuses on recruiting volunteers to clean the river corridor and KFWB focuses on recruiting volunteers to clean the neighborhoods. Jointly, KFWB and TRWD promote the message "All litter in the street ends up in our waterways." KFWB spent \$112,000+ in direct costs on litter abatement activities in 2015. While excluded from the cost totals in this Study, KFWB estimated the total value generated by volunteer and participant labor is \$197,100 and in-kind donations totaled \$14,100.
Tarrant Regional Water District (TRWD)	Sponsors the biannual Trinity River Trash Bash—a volunteer clean-up event with locations along the West Fork, East Fork, and Clear Forks of the Trinity River. TRWD spends \$166,400+ annually on these events. While excluded from the cost totals in this Study, the value of the volunteer labor is an additional \$185,800+. Additionally, TRWD manages the Reverse Litter Program, which brings awareness to the consequences litter can have on area waterways. The amount TRWD spends annually on abatement is directly related to annual rainfall totals. TRWD deploys its litter abatement crews each time the rain gauge reads at least a ½-inch of rain, when an inquiry is received through the website, by phone, or while performing floodway maintenance. TRWD uses contract labor primarily for vegetative maintenance; however, the contract laborers spend weekends on litter cleanup resulting in an allocated cost to TRWD of \$158,500 annually.



TRWD's Trinity River Trash Bash



DFWI Street Maintenance Staff

Key Organizations

- City of Fort Worth
 - Police Department
 - Code Compliance
 - Environmental Management
 - Solid Waste Services (SWS)
 - Keep Fort Worth Beautiful (KFWB)
 - Transportation and Public Works
 - Stormwater Management
 - City Attorney's Office
- Tarrant Regional Water District (TRWD)

Additional Organizations

- Fort Worth Independent School District (FWISD)
- Fort Worth Transportation Authority (FWTA)
- North Texas Toll Authority (NTTA)
- BNSF Railway (BNSF)
- Downtown Fort Worth, Inc. (DFWI)

ORGANIZATION	DESCRIPTION
North Texas Tollway Authority (NTTA)	Hires a contractor to keep the right-of-way free of litter and debris, including tires, tire tread, hazardous material, and other potentially dangerous material on Chisholm Trail Parkway. The contractor also clears and disposes of litter and debris from detention ponds adjacent to the roadway. In 2015, NTTA spent \$248,000 on these services.
Downtown Fort Worth Inc. (DFWI)	DFWI provides trash cans in the downtown area to prevent litter. DFWI also employs contractors to sweep streets in the downtown area daily and prior to special events. Additionally, DFWI also contracts for vacuuming the curb and gutter line of streets using a walk-behind sweeper. These efforts in the downtown area alone contribute 8,400 additional gutter miles of street sweeping annually. Based on a recent resident survey published in the 2015 State of Downtown, 98.3 percent of residents rated the streets and sidewalks in Downtown as clean or very clean. According to DFWI, cleanliness directly correlates to the perception of safety in Downtown. DFWI reports that it spent \$1,000,000* in 2015 on litter pick-up.
Fort Worth Independent School District (FWISD)	At each school the custodians are responsible for cleaning litter from the school property. FWISD estimates that time and material directed at these efforts is around \$50,000* per year.
Fort Worth Transportation Authority (FWTA)	Removes illegal dumping and litter from FWTA properties, which costs about \$345,000 per year.
BNSF Railway (BNSF)	Removes illegally dumped material when notified by agencies or BNSF employees.*

ABATEMENT: ILLEGAL DUMPING

According to the City's annual sewer and stormwater report (July 2014-July 2015), SWS removed 2,800 tons of debris from illegal dump sites. Some of the sites were identified by code compliance officers. Five crews including a boom operator and truck driver collected the material. These crews have made significant progress in abating legacy illegal dump sites and the total tonnage collected, such that the number of staff has reduced from 24 employees in 1996 to 12 employees today. However, the number of new illegal dumping sites has increased. This program costs the City \$1,000,000+ annually.

In 2015, TRWD spent approximately \$85,000 in litter and illegal dumping abatement. These expenditures cover landfill fees, TRWD labor, tools, and equipment related to debris removal from dams and trash collectors.

The FWTa spent \$5,000 in 2015 to remove items illegally dumped at bus shelters and train stations.

ENFORCEMENT

When the Fort Worth Code Compliance Department (Code) typically receives a complaint via phone, email, or a submittal from their website about a residential or commercial property, a compliance officer goes to investigate the complaint. If there is a code violation, the officer will serve a notice to the property owner. If the violation is not resolved, the officer will issue a citation. It is up to the officer's discretion to set the level of the fine, which is typically based on the quantity of litter observed. In 2015, litter and illegal dumping violations in the City were the third highest on record at approximately 750 violations per month. The Department Code Officers dealing with litter and illegal dumping are divided among the following three sectors: 40 in neighborhood, six in commercial, and four nuisance abatement officers. These officers spend approximately 50 percent of their time addressing litter and illegal dumping enforcement, resulting in an allocated cost for the City of \$1,464,000+. With increased enforcement Code reports improvements in substandard properties.

In an effort to reduce the workload for compliance officers, the Code Rangers Program trains citizen organizations to identify and submit reports of suspected code violations to Code, allowing Code officers the opportunity to devote more time to chronic, dangerous, or complicated issues affecting the neighborhood. This training cost the City \$37,400 in 2015. In 2015, the Code Rangers reported approximately 1,800 code violations.² Also supporting the code officers are health inspectors who have been trained to identify problem litter areas and educate the businesses on property maintenance ordinances.

The City's Litigation and Code Section within the City Attorney's Office handles municipal code violations. Their prosecutors typically offer plea bargains to remedy problem properties. However the City Attorney's Office has the ability to file lawsuits against the owners, seeking injunctive relief and civil penalties. Court costs for litter and illegal dumping cases cost the City \$1,400 in 2015.

Additionally, when BNSF railway police find litter and illegal dumping cases along railways, BNSF works to identify and locate the potentially guilty parties and prosecute them.*

² Not detailed by violation type

COST ALLOCATION TABLE

The City of Fort Worth provided a detailed analysis of the individual program costs. This allocation summary table provides a breakdown of the total costs by activity reported in the Cost Summary.

Program	Department or Organization	Allocated Costs by Activity						
		Litter Prevention	Illegal Dumping Prevention	Education & Outreach	Litter Abatement	Illegal Dumping Abatement	Enforcement	Total
Litter Prevention								
"Litter Costs You Money" signage along tollway	North Texas Tollway Authority (NTTA)	\$ - *	\$ - *	\$ - *	\$ - *	\$ - *	\$ - *	\$ - *
Homeless Outreach	Fort Worth Police Department (FWPD)	\$1,800	\$ - *	\$ - *	\$ - *	\$ - *	\$ - *	\$1,800
Illegal Dumping Prevention								
Drop-off Stations	City of Fort Worth - Solid Waste Services (SWS) Division	\$339,400	\$1,018,200	\$ - *	\$ - *	\$ - *	\$ - *	\$1,357,600
Education and Outreach								
Educational events and materials, and litter-related news stories	KFWB	\$ - *	\$ - *	\$10,000	\$ - *	\$ - *	\$ - *	\$10,000
Reverse Litter Campaign	Tarrant Regional Water District (TRWD)	\$200,000	\$ - *	\$200,000	\$ - *	\$ - *	\$ - *	\$400,000
Reverse Litter Campaign	City of Fort Worth contribution to program cost	\$100,000	\$ - *	\$100,000	\$ - *	\$ - *	\$ - *	\$200,000
Adopt-a-River and Adopt-a-Drain Programs	TRWD	\$12,600	\$ - *	\$12,600	\$ - *	\$ - *	\$ - *	\$25,200
Social Media Outreach Activities	TRWD	\$ - *	\$ - *	\$1,500	\$ - *	\$ - *	\$ - *	\$1,500
Litter Abatement								
Litter Abatement Crews	SWS Division	\$110,000	\$ - *	\$165,000	\$495,000	\$ - *	\$330,000	\$1,100,000
Stormwater Maintenance Crews	City of Fort Worth - Transportation and Public Works, Stormwater Management Division	\$ - *	\$ - *	\$ - *	\$621,900	\$155,500	\$ - *	\$777,400
Direct Costs for Litter Abatement Activities and Events	KFWB	\$16,800	\$ - *	\$16,800	\$78,400	\$ - *	\$ - *	\$112,000
Trash Bash	TRWD	\$41,600	\$ - *	\$41,600	\$83,200	\$ - *	\$ - *	\$166,400
Litter Abatement Events	TRWD	\$ - *	\$ - *	\$ - *	\$158,500	\$ - *	\$ - *	\$158,500
Right-of-way Cleanup	NTTA	\$ - *	\$ - *	\$ - *	\$248,000	\$ - *	\$ - *	\$248,000
Downtown Cleanup	Downtown Fort Worth Inc. (DFWI)	\$ - *	\$ - *	\$ - *	\$1,000,000	\$ - *	\$ - *	\$1,000,000
School Property Cleanup	Fort Worth Independent School District (FWISD)	\$ - *	\$ - *	\$ - *	\$50,000	\$ - *	\$ - *	\$50,000
Property Cleanup	Fort Worth Transportation Authority (FWTA)	\$ - *	\$ - *	\$ - *	\$345,000	\$ - *	\$ - *	\$345,000
Illegal Dumping Abatement								
Illegal Dumping Abatement Crews	SWS Division	\$ - *	\$100,000	\$100,000	\$ - *	\$700,000	\$100,000	\$1,000,000
Illegal Dumping Abatement Crews	TRWD	\$ - *	\$ - *	\$ - *	\$ - *	\$85,000	\$ - *	\$85,000
Illegal Dumping Cleanup at Bus Stops	FWTA	\$ - *	\$ - *	\$ - *	\$ - *	\$5,000	\$ - *	\$5,000
Enforcement								
Neighborhood Code Enforcement, Nuisance Abatement Team, and Commercial Code Enforcement	City of Fort Worth Code Compliance Department (Code)	\$ - *	\$ - *	\$249,600	\$312,000	\$312,000	\$590,400	\$1,464,000
Code Rangers Liaison	Code Compliance	\$ - *	\$ - *	\$ - *	\$ - *	\$ - *	\$37,400	\$37,400
Code Violation Prosecution	City Attorney's Office	\$ - *	\$ - *	\$ - *	\$ - *	\$ - *	\$1,400	\$1,400
	Totals	\$822,200	\$1,118,200	\$897,100	\$3,392,000	\$1,257,500	\$1,059,200	\$8,546,200

HOUSTON: THE BAYOU CITY

Covering 600 square miles and home to 2.3 million people, the City of Houston (City) is the fourth largest city in the U.S. Since its founding in 1837 along the banks of Buffalo Bayou, waterways have been an integral part of the City, ranging from the many bayous to the economic engine that is the Port of Houston, the second busiest port nationally. As a city with many waterways, Houston incurs extensive costs cleaning bayous and other waterways.

Given the importance of its waterways and sheer size of the community, extensive collaboration occurs among the City and multiple other entities to address litter and illegal dumping. This collaboration has resulted in the development of extensive efforts focused on abatement and enforcement.

Cost Summary

ACTIVITY	LITTER	ILLEGAL DUMPING
Prevention	\$250,000*	\$2,200,000
Education and Outreach	\$200,000	
Abatement	\$13,390,600*	\$617,400*
Enforcement	\$4,462,900*	
2015 Litter & Illegal Dumping Costs	\$21,120,900	

ALTERNATIVE REVENUES

In an effort to offset the costs of illegal dumping, the Harris County District Attorney will request that illegal dumpers pay \$300 in restitution for the use and maintenance of the cameras and a clean-up fee based on the costs incurred for the clean-up (if the property owner does not clean up the site). These amounts are in addition to any fines or jail or community service.

Key Takeaways

- The total amount spent on litter and illegal dumping amounts to more than \$9 per person, and the range of litter and floatable removal cost is \$20 to \$189 per cubic yard depending on a range of factors including location.
- The Harris County District Attorney's Office has found the use of surveillance cameras is an effective tool to prosecute cases of illegal dumping.
- The Harris County Attorney requests illegal dumpers pay restitution fees for surveillance camera and clean-up costs.

*In some cases, the responding entity did not have complete cost data. An asterisk indicates the entity has a program in place but that the direct cost data was not available for this Study.

PREVENTION

To minimize litter in the City's extensive network of parks, the Parks Department provides litter receptacles across the City.* The City's Department of Neighborhoods has a mow down program focused on controlling overgrown lots, which is intended to prevent litter and illegal dumping, costing the City \$250,000 annually.

In an effort to reduce illegal dumping, the City operates six neighborhood depositories, which accept a wide range of materials. Operating these facilities costs the City \$2,200,000 annually. The City's objective for these facilities is to provide a convenient and no-cost alternative to illegal dumping, as residents can use the sites up to four times per month at no charge.

EDUCATION & OUTREACH

As an example of the collaborative approach to reducing litter and illegal dumping, multiple city departments provide education and outreach services. The Solid Waste Management Department has focused its messaging on the importance of reducing and cleaning up illegal dump sites across the City. The Public Works and Engineering Department emphasizes the need to reduce litter and illegal dumping via multiple programs. One example is emphasizing the importance of litter reduction as part of an exhibit at one of the City's water treatment plants. The annual outreach budget for the programs in the Public Works and Engineering Department is \$200,000.

Fast Facts

Location: Southeast Texas

Population: 2,296,000

Waterways:

- Buffalo Bayou fed by Barker Reservoir
- Mason Creek
- Langham Creek
- South Mayde Creek
- Brays Bayou
- Greens Bayou
- Hunting Bayou
- Sims Bayou
- Whiteoak Bayou
- Little Whiteoak Bayou
- Lake Houston fed by the East Fork of the San Jacinto River
- San Jacinto River fed by Lake Houston
- Cypress Creek

Annual Precipitation: 54.9 inches



Buffalo Bayou Partnership litter and floatables waterway cleanup crews.

ABATEMENT: LITTER

The City removes litter from the community through a variety of collaborative efforts. The Harris County Flood Control District (HCFCD) coordinates multiple litter abatement efforts as a part of the District's Phase 1 Municipal Separate Storm Sewer System (MS4) permit, which is a joint permit between HCFCD, the City, Harris County and the Texas Department of Transportation. The following table summarizes key efforts by the Task Force and other organizations to abate litter.

ORGANIZATION	DESCRIPTION
Harris County Flood Control District (HCFCD)	Removal of 5,043 tires, 4,987 cubic yards of litter and floatables, 163 cubic yards of miscellaneous debris and 31,972 cubic yards of organics and wood at an annual cost of \$1,616,700 in 2015.
City of Houston	Sweeps 6,117 miles of streets sweeping at an annual cost of \$410,000 and removed 7,027 cubic yards of litter and floatables in 2015 removal at an annual cost of \$1,327,400, about \$189 per cubic yard.
Harris County	Sweeps 52,588 miles of streets sweeping at an annual cost of \$4,816,600 and removed 129,500 cubic yards of litter and floatables in 2015 at a cost of \$2,546,900, about \$20 per cubic yard.
Texas Department of Transportation	Removal of litter at an annual cost of \$538,300 in 2015.
Buffalo Bayou Partnership	With a combination of booms, vacuum boats, and manual clean-up, this partnership focuses on cleaning floatables from bayous at an annual cost of \$500,000, about \$137 per cubic yard.
Houston Parks Board	Focused on the walkways along the bayous, cleaned approximately 1,131 acres at an annual cost of \$761,000.
Houston-Galveston Area Council Trash Bash	Regarded as the largest waterway clean-up in Texas, River, Lakes, Bays 'n Bayous Trash Bash had participation from 4,600 volunteers and collected 54 tons of trash. Annual program costs from staff time, grants, and sponsorships totaled \$60,500. While excluded from the cost totals in this Study, in-kind donations totaled \$80,000.
Keep Houston Beautiful (KHB)	Working to remove litter from neighborhoods and bayous, KHB has an annual budget of \$813,200. While excluded from the cost totals in this Study, KHB and received \$456,000 in in-kind services (such as the City providing collection vehicles for disposal) and volunteers provided more than 68,000 hours of litter clean-up efforts.
Management Districts	There are multiple management districts, also known as "improvement districts," in specific geographic areas of the City that focus on supporting capital improvements, neighborhood revitalization, and services. Management district services include providing litter removal within the district.*



Houston-Galveston Area Council's River, Lakes, Bays 'n Bayous Trash Bash

ABATEMENT: ILLEGAL DUMPING

The City's Solid Waste Management Department has multiple programs focused on illegal dumping abatement. The City operates a Tree Waste and Junk Collection Program, alternating collections on a monthly basis. During lighter collection months for tree waste, the City will send crews to clean up illegal dump sites.*

Working with the City's Health Department, the Solid Waste Management Department has provided heavy trash and rear-loader crews to conduct cleanups in an effort to reduce the potential spread of the Zika Virus at an annual cost of \$550,000. Efforts are coordinated to focus on key areas of the City's council districts. As an example of the extent of illegal dumping, six heavy trash and six rear-load crews collected 113 tons of illegal dumping in a single day.

The Houston Police Department (HPD) spends \$27,000 on clean-up costs. The HPD Environmental Investigations Unit spent an additional \$40,400 on clean-up and sampling costs related to illegal dumping sites. While excluded from the total costs in this Study, HPD estimated that volunteers contributed more than \$74,000 of value.

Key Organizations

- City of Houston
 - City Council Districts
 - Solid Waste Management Department
 - Neighborhoods Department
 - Parks Department
 - Police Department (HPD)
 - Public Works and Engineering (PWE)
- Harris County
 - County Attorney (HCAO)
 - District Attorney (DAO)
 - Environmental Crimes Unit (HCECU)
 - Flood Control District (HCFCD)
 - Pollution Control Services Department (HPCPS)
- Keep Houston Beautiful
- Buffalo Bayou Partnership
- Houston-Galveston Area Council
- Houston Parks Board

Additional Organizations

- Multiple management districts
- Texas Department of Transportation

ENFORCEMENT

Due to illegal dumping and littering issues within the community, there is a substantial commitment by the City and multiple organizations within Harris County to address environmental crimes and to track their costs. Key enforcement efforts include the following.

ORGANIZATION	DESCRIPTION
City of Houston- Environmental Investigations Unit of the Police Department (HPD)	Addressing a range of environmental crimes, the combination of 14 peace officers, civilian code enforcement officers, community outreach staff, and administrative personnel investigate hundreds of illegal dumpsites annually, mainly focused on construction and demolition debris, scrap tires, and household hazardous waste. This program costs the City \$1,442,900 per year in salaries, vehicles, and equipment.
Harris County - Office of the District Attorney (DAO)	With two staff, the Harris County District Attorney spearheads all criminal environmental enforcement cases brought forth by the County, with many cases focusing on illegal dumping. This program costs the County \$468,000 per year in salaries and administrative costs.
Harris County - Attorney's Office (HCAO)	With a staff of 3.5 people, the HCAO oversees the civil environmental enforcement cases brought forth by the County. While there is a preference to prosecute cases criminally (as provided by the District Attorney), civil cases are sometimes preferred because the process for filing several violations at once is more simple and streamlined than with criminal prosecution.*
Harris County - Environmental Crimes Unit (HCECU)	Working closely with HPD and a number of other local authorities, the Environmental Crimes Unit proactively investigates illegal dumping cases, using cameras and other technology. With a staff of six investigators and three administrators, their annual budget is \$1,300,000.
Harris County Pollution Control Services Department (HCPCS)	With a staff of 20 investigators addressing air, water, and solid waste pollution complaints, three staff members focus on solid waste issues. With an in-house lab, HCPCS often performs laboratory analysis that is provided to the HCAO for prosecution. Annual costs for the three investigators total \$200,000.
City of Houston - Health Department	Conducting inspections of environmental complaints costs \$79,000 per year.
City of Houston - Public Works and Engineering (PWE)	Conducting inspections of environmental complaints costs \$973,000 per year.



Before and After: As a chronic illegal dump site, the HCECU monitored the site, resulting in efforts to have it cleaned up. The proactive enforcement efforts have kept the site clean.

Effective Collaboration between the City of Houston and Harris County: Surveillance Cameras

In 2012, during talks between the City of Houston and Harris County on how to better serve the community and stop illegal dumping, which was rising in some areas, Councilman Jerry Davis pushed for more enforcement in those city council district's (Districts B, D, K, I, H) that were seeing increased illegal dumping. The initial agreement between the City and County was for each district to receive five cameras for enforcement, for a total cost of \$250,000. After starting the camera program, the HCECU reduced the costs of the cameras by building them in-house, which allowed funding to be used for video monitoring and storage. The Harris County District Attorney's Office has found that the use of these cameras is very effective in prosecuting cases.

LAREDO: THE GATEWAY CITY

The City of Laredo (City) is developing a hub-and-spoke trail system along its creeks to improve the quality of life. An 8-mile hike and bike trail along Chacon Creek from Texas A&M International University (TAMIU) to the Rio Grande River in southeast Laredo, including a 3-mile greenbelt, already exists along Zacate Creek, which runs parallel to Interstate 35.

With four international bridges linking Laredo to Nuevo Laredo, the City is challenged by a highly mobile population consisting of primarily commercial vehicle traffic. According to City officials, a highly mobile population feels a lack of connection and ownership of the cleanliness of the community.

ALTERNATIVE REVENUES

Keep Laredo Beautiful (KLB), street sweeping and tire collections are funded through stormwater fees. The monthly residential and multifamily fee per unit is \$6.50 and the commercial rate ranges from \$8.00 to \$120.00 depending on property square footage. The City reports KLB received \$101,000 in 2015 and Public Works received \$1,400,000 for street sweeping and tire collection.

Cost Summary

ACTIVITY	LITTER	ILLEGAL DUMPING
Prevention	\$88,800*	\$ - *
Education and Outreach	\$134,300	
Abatement	\$4,090,000*	\$5,000*
Enforcement	\$140,000	
2015 Litter & Illegal Dumping Costs	\$4,458,100	



Lake Casa Blanca

Key Takeaways

- A highly mobile population feels a lack of connection and ownership of the cleanliness of the community.
- The City's Commercial Litter Prevention Ordinance has reduced the amount of litter found on commercial properties.
- The City has experienced less illegal dumping when it raises the profile and awareness of illegal dumping prosecutions through local media.

*In some cases, the responding entity did not have complete cost data. An asterisk indicates the entity has a program in place but that the direct cost data was not available for this Study.

PREVENTION

Recognizing the negative impact of commercial litter on Laredo, City Code contains a Commercial Litter Prevention Ordinance that requires most commercial establishments to place trash receptacles in their parking areas. Further, for medium and large commercial establishments, the Code requires those businesses to submit a Commercial Litter Prevention Plan (Plan) to the City prior to the start of their operations. Each Plan must contain:

- A detailed property map with prevailing wind direction, placement of required trash receptacles and anti-litter signs (if applicable)
- Summary of commercial litter found on property
- Schedule for receptacle collection services
- Schedule for litter cleanup activities
- Signed certification that the business will comply with the Plan
- Signed certification that the business will dispose of all their trash at a registered landfill

In 2014, the Laredo City Council passed a Checkout Bag Reduction Ordinance in part to “reduce costs associated with floatable trash controls and the maintenance of the municipal separate stormwater sewer system.” Historically, Laredoans consumed 120 million single-use plastic bags annually. The ordinance applies to all commercial establishments. City staff from the Stormwater Division have seen significant decreases in the amount of plastic bags in the stormwater sewer system since the ordinance took effect in April 2015. The Rio Grande International Study Center (RGISC) distributed over 10,000 “Loving Laredo” reusable bags in 2015 while the ESD handed out 80,000. These bags cost RGISC \$8,800 and the City \$80,000. As of September 2016, a state appeals court struck down the Checkout Bag Reduction Ordinance, as being incongruent with current state law.

To prevent illegal dumping of appliances, the Solid Waste Department (SWD) allows free disposal at the landfill on Saturday and a subsidized rate of \$2.00 per appliance on weekdays.*

In response to litter found obstructing downtown storm drains, the City offers additional special collections for downtown merchants.*

To combat the problem of illegal dumping of tires, the City passed an ordinance in 2014 that requires tire businesses to collect used or scrap tires from the customer at the time the customer purchases new or used tires. If the customer does not leave the old tires, then a \$10 deposit per tire is charged. Any person caught illegally dumping tires can be fined from \$500

Fast Facts

Location: South Texas

Population: 255,000

Waterways:

- Chacon Creek
- Lake Casa Blanca
- Rio Grande River
- San Idelfonso Creek
- Zacate Creek
- Link Lake

Annual Precipitation: 20.2 inches



Zacate Creek Greenway

to \$2,000 per offence, and businesses failing to comply with the ordinance are subject to license revocation and can be fined up to \$2,000.*

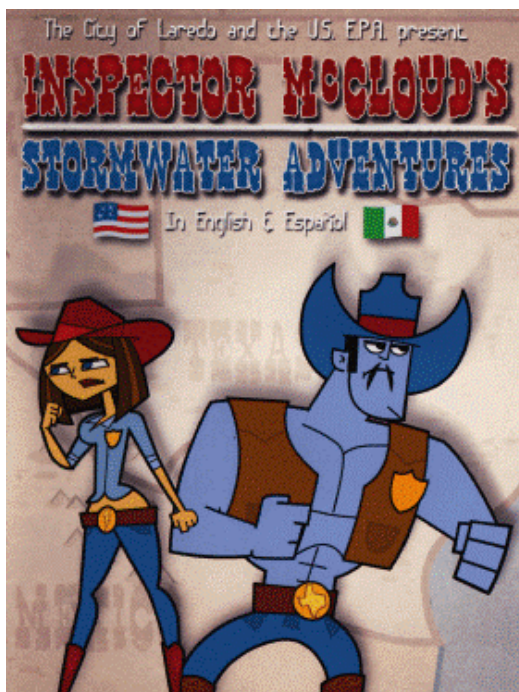
EDUCATION & OUTREACH

The Stormwater Division within the Environmental Services Department (ESD) has a bilingual education and outreach program coordinator who develops anti-litter curriculum for school-aged children. Supplementing the school presentations is an extensive supply of multi-media educational material on the ESD website.¹ Educators can access material such as videos with age-targeted mascots, color story books, and music. In total, these education and outreach materials and presentations cost the ESD \$128,000 in 2015.

The RGISC has taken a lead on educating the public on the environmental impact of plastic bags. It produced a bilingual 30-second public service announcement and held informational meetings for schools, civic groups, and government officials. The RGISC is quick to note in their education and outreach that the Rio Grande River is on the World Wildlife Fund's "10 Rivers at Risk." The RGISC spent approximately \$6,300 in 2015 on education and outreach.

Key Organizations

- City of Laredo
 - Environmental Services Department (ESD)
 - Stormwater
 - Keep Laredo Beautiful (KLB)
 - Solid Waste Department (SWD)
- Rio Grande International Study Center (RGISC)



Mascot for Older Children



Mascot for Younger Children

¹ <http://esd.ci.laredo.tx.us/esdweb/news/edu.cfm>

ABATEMENT: LITTER

The City removes litter from the community through the ESD and with the support of Keep Laredo Beautiful, TAMIU, and the RGISC.

ORGANIZATION	DESCRIPTION
City of Laredo - Environmental Services (ESD)	Contracts monthly creek cleanups along Laredo's three major creek systems. This contract is valued at \$554,000 per year. The Stormwater Division spends \$220,000 per year in personnel, equipment, disposal fees, fuel, and supplies for two vacuum truck crews that remove litter and debris from the City's storm sewer system.
City of Laredo - Public Works (PWD)	The PWD spends \$1,500,000 per year on creek cleaning, and the street cleaning division spends \$1,700,000 per year sweeping city streets.
Texas A&M International University (TAMIU)	Hosts "The Big Event" annually where over 300 students collected more than 27 tons of litter within 140 city blocks in 2016.*
Keep Laredo Beautiful (KLB)	Hosted 20 cleanup events, including eight waterway cleanups in 2015. KLB spent \$114,000 in direct costs to host these events. A total of 2,150 volunteers contributed 10,750 hours and collected 36.7 tons of trash and more than five tons of tires (436 tires). While excluded from the cost totals in this Study, KLB estimated that volunteers contributed the equivalent of \$247,300 in effort, and KLB received \$345,000 in in-kind donations.
Rio Grande International Study Center (RGISC)	Hosts three large-scale community cleanups annually with 100 to 400 volunteers per event and 5 to 7 smaller cleanup events with 30 to 100 volunteers for a severely impaired wetland or creek area. Direct costs to host these events totaled \$2,000 in 2015. The RGISC received \$82,900 in in-kind donations and 400 volunteers contributed 7,360 hours.

ABATEMENT: ILLEGAL DUMPING

ESD offers an Illegal Dumping Hotline where callers can report illegal dumping activities. Staffing this hotline for illegal dumping calls costs the City \$5,000 per year.

The SWD runs three-person special collection crews with a grapple truck and rear loader. These crews spend approximately 30 percent of their time remediating illegal dumping sites, which are typically empty residential lots. About half of the illegally dumped material is trash while the other half is clean brush.*

ENFORCEMENT

Two ESD environmental investigators enforce illegal dumping ordinances by inspecting known illegal dumping areas, such as dead end roads. ESD estimates that it spent \$140,000 on its environmental investigators in 2015. The environmental investigators are unable to identify offenders in a majority of illegal dumping cases. However, when they do identify offenders, the investigators write citations that can range from \$500 to \$4,000. The City approaches illegal dumping prosecutions by creating high case visibility. Illegal dumping prosecutions are reported in the local newspaper and television stations. ESD reports that it has seen a reduction in illegal dumping when it takes this approach.

LUFKIN:

CROSSROADS OF EAST TEXAS

Nestled between the Davy Crockett and Angelina National Forests, Lufkin has a robust business community. Brookshire Brothers Grocer, Lufkin Industries (now GE Oil and Gas), and the Atkinson Candy Company are headquartered in Lufkin. Residents and visitors enjoy City Lake in Ellen Trout Park, adjacent to the zoo. The City of Lufkin (City) relies on its numerous creeks and drainages for stormwater conveyance.

Litter and illegal dumping are primarily found in abandoned and blighted areas within the Lufkin city limits. According to City staff, city streets without a curb and gutter seem to attract litter in drainage ditches. Wind and water eventually deposit this litter into surrounding creek beds. The City also reports illegal dumping under bridges that cross creeks. The primary items illegally dumped in Lufkin are filled trash bags, tires, and household electronics. City staff believe the filled trash bags are likely from area residents outside the City limits without refuse collection services.

Cost Summary

ACTIVITY	LITTER	ILLEGAL DUMPING
Prevention	\$ - *	\$16,600*
Education and Outreach	\$2,000*	
Abatement	\$149,900*	\$13,700
Enforcement	\$50,600	
2015 Litter & Illegal Dumping Costs	\$232,800	

ALTERNATIVE REVENUES

The Solid Waste District (SWD) receives revenue from its residential and commercial solid waste customers to fund its anti-litter and illegal dumping efforts. The City has no alternative funding sources.

Key Takeaways

- Trash bags, tires, and household electronics comprised most illegally dumped items, which City staff believe are dumped by residents outside the City limits without refuse collection services.
- The Code Enforcement Department (CED) believes increased levels of enforcement would result in less visible litter.

*In some cases, the responding entity did not have complete cost data. An asterisk indicates the entity has a program in place but that the direct cost data was not available for this Study.

PREVENTION

The City and Angelina Beautiful/Clean (AB/C), a nonprofit that empowers residents to enhance the community environment, offer free drop-off days at the City of Lufkin Recycling Center during the Household Hazardous Waste Collection Day in the spring and the Tire and Electronic Recycling Day in the fall. Residents can drop off discarded white goods (e.g., refrigerators and hot water heaters) electronics, and other hazardous items (e.g., car batteries and tires). Event organizers say these events curb the amount of material that is illegally dumped. Each event collects around 4,000 tires and cost the City a total of \$16,600 in 2015.

Fast Facts

Location: Deep East Texas

Population: 36,000

Waterways:

- Cedar Creek
- Hurricane Creek
- City Lake
- Jones Lake
- Lake Mynad
- Numerous unnamed creeks and drainages

Annual Precipitation: 48.9 inches

In the past, the Police Department has assisted the Code Enforcement Department (CED) by placing cameras in areas where illegal dumping is common, and the Street Department will install “No Dumping” signage. These efforts have deterred illegal dumping in those areas.*

EDUCATION & OUTREACH

For Lufkin’s primary schools, Keep Lufkin Beautiful (KLB) volunteers present curriculum from Keep America Beautiful’s Waste-in-Place program. The Waste-in-Place program emphasizes responsible solid waste handling practices through hands-on activities. While excluded from the cost totals in this Study, volunteers contributed 270 hours in Lufkin schools in 2015.

During the summer, the Texas Forestry Museum holds EEK! Week (Environmental Education Kamp) for pre-teens. The camp includes a tour of the Angelina County Landfill the Lufkin Recycling Center, and litter prevention topics. Hosting the camp costs the Texas Forestry Museum \$2,000 per year.



Tire and Electronics Recycle Day

ABATEMENT: LITTER

The City removes litter from their community through a variety of departments and KLB.

ORGANIZATION	DESCRIPTION
Solid Waste (SWD)	A litter abatement crew collects litter in City rights-of-way and main thoroughfares in town. These crews cost the City \$51,500 in 2015.
Parks and Recreation (PRD)	Oversees 16 municipal parks within Lufkin. Two staff are regularly dedicated to maintaining park cleanliness, which includes litter pick-up. During the summer months when the number of citizens using parks is high the PRD contracts temporary workers to support cleanup efforts. In total, the PRD spends \$98,100 per year on park cleanup.
Streets (SD)	Removes litter and debris from creeks, storm drains, and detention ponds to prevent back flow and street flooding during rain events using a grapple truck, a vehicle with a rear-mounted excavator, with one or two tandem dump trucks.*
Keep Lufkin Beautiful (KLB)	Hosts the Don't Mess with Texas Trash-Off spring cleanup event and another cleanup event in the fall. KLB estimates the direct cost to host these community-wide events was \$300 in 2015. While excluded from the cost totals in this Study, over 150 volunteers participated in the cleanups in 2015.*

ABATEMENT: ILLEGAL DUMPING

When illegal dumping is reported by a 311 work order, CED, or SD, the SWD deploys its special collections crew with a grapple truck and rear-loader (separate from the Street Department's equipment) to clear the pile. The SWD estimates that it spends \$13,700 annually to address illegal dump sites.

ENFORCEMENT

The CED code enforcement officers respond to online complaints and phone calls reported to 311. When necessary, the CED distributes notices of violation to residents and businesses where litter has proliferated on sidewalks and rights-of-way in front of their property. The code officers attempt to contact the owner or tenant before contacting the SWD to assign the litter abatement or special collections crew to remove the litter or illegally dumped debris. Once contacted by the CED, the owner or tenant has 24 hours to remove the litter or debris. If the violator does not comply with the notice of violation, the CED files a citation in the municipal court where the violator could be fined up to \$500. The CED reports that addressing litter and illegal dumping cases costs the City \$50,600. With increased levels of enforcement, the CED believes there are decreased levels of visible litter.

Key Organizations

- City of Lufkin
 - Police Department
 - Solid Waste Department (SWD)
 - Code Enforcement Department (CED)
 - Parks and Recreation Department (PRD)
 - Street Department (SD)
- Keep Lufkin Beautiful (KLB)/Angelina Beautiful Clean (ABC)
- Texas Forestry Museum

MIDLAND: FEEL THE ENERGY!

With an economy that relies heavily on the oil and gas sector, Midland is home to numerous oil and gas companies that operate in the area. As such, the City of Midland (City) and the Midland Chamber of Commerce (Chamber) work to attract businesses to the community. These companies seek a high standard of living with community cleanliness as one of the factors. Recognizing cleanliness as a key facet to Midland livability, the City and the Chamber formed the predecessor to Keep Midland Beautiful (KMB) in the early 1980s.

Located in the semi-arid Permian Basin, Midland has no natural waterways. Manmade drainage ditches run through Midland and collect much of the windblown litter and illegal dumping. With an increase in oil and gas activity, the community experiences higher levels of litter and illegal dumping. Oil field workers are a highly mobile population, which may contribute to a feeling of a lack ownership in the cleanliness of the community and results in elevated levels of litter and illegal dumping.

Cost Summary

ACTIVITY	LITTER	ILLEGAL DUMPING
Prevention	\$ - *	\$139,500
Education and Outreach	\$10,900	
Abatement	\$122,800*	\$ - *
Enforcement	\$227,000	
2015 Litter & Illegal Dumping Costs	\$500,200	

ALTERNATIVE REVENUES

To supplement litter abatement, special cleanups, and beautification, such as funding KMB, the Solid Waste Department (SWD) charges a \$1 monthly fee. In 2015, this fee generated \$435,800.

In an effort to reduce windblown litter sourced from overflowing trash cans, SWD will penalize customers who allow litter to accumulate around their trash cans. SWD charges violators \$20 to \$200 on their monthly water bill and collected \$4,700 in 2015.

Key Takeaways

- Keep Midland Beautiful (KMB) offers “Trash For Cash,” a program where non-profit organizations can organize groups of volunteers to pick up litter and receive up to \$3,000 per year for their generated value.
- At assigned times of the year, the City allows residents to dispose of yard waste on designated City-owned vacant lots to prevent illegal dumping.
- The Solid Waste Department (SWD) employs a full-time environmental officer to address litter-related code issues. Code Enforcement (Code) responded to 6,900 litter and illegal dumping cases in 2015.
- SWD may issue customers penalties of \$20 to \$200 on their monthly water bill if litter is encountered around trash cans. SWD collected \$4,700 in penalties in 2015.

*In some cases, the responding entity did not have complete cost data. An asterisk indicates the entity has a program in place but that the direct cost data was not available for this Study.

PREVENTION

For residential customers, the SWD will pick up furniture and appliances curbside at no additional charge when the customer calls in the request. The SWD does not collect yard waste, construction debris, tires, or vehicle batteries curbside. However, residents may drop off yard waste at the Citizen Collection Station. The SWD estimates that the curbside service and to operate the citizen collection station costs the City \$139,500 per year.

EDUCATION & OUTREACH

In coordination with KMB, the SWD has an education coordinator who presents customized curriculum on litter awareness at local schools and social and civic organizations. KMB and SWD estimate that this service to the community costs \$10,900 per year.

KMB has an active Facebook account that engages citizens in litter prevention, beautification, and waste management activities.

ABATEMENT: LITTER

The City removes litter from the community through the SWD and KMB.

Fast Facts

Location: West Texas

Population: 133,000

Waterways:

- Beal Park Lake

Annual Precipitation: 14.8 inches



Educational Presentations

ORGANIZATION	DESCRIPTION
Solid Waste (SWD)	A litter abatement crew collects litter in City rights-of-way and main thoroughfares in town resulting in an annual cost of \$66,300.
Keep Midland Beautiful (KMB)	Hosts annual cleanup campaigns in late spring (Trash-Off) and the fall (Make A Difference Day) that regularly see 3,000 participants. KMB spent \$1,900 in direct costs to host the semi-annual cleanups in 2015. While excluded from the cost totals in this Study, KMB received \$25,000 in in-kind donations and estimated that volunteers contributed the equivalent of \$222,600 in effort. KMB also offers a program called "Pick Up Some Trash to Pick Up Some Cash" where non-profit organizations can receive funding by organizing groups of volunteers to clean up designated areas. KMB calculates the value the non-profit earns based on \$5 per hour per volunteer up to \$500 per cleanup event. Each non-profit organization can submit documentation of six cleanups per year to receive up to \$3,000. In 2015, KMB distributed \$54,600 to non-profit organizations for litter cleanup.

ABATEMENT: ILLEGAL DUMPING

When illegal dumping is reported by a 311 work order, Code Enforcement, or Street Department, the SWD deploys its special collections crew (also referred to as litter abatement) with a grapple truck and rear-loader to clear the pile.*

Key Organizations

- City of Midland
 - Solid Waste Department (SWD)
 - Code Enforcement Department (Code)
 - Mayor's Office
- Keep Midland Beautiful (KMB)

ENFORCEMENT

The City municipal code does not permit litter accumulation on private property. Fines may reach \$2,000. The SWD has a full-time environmental officer who addresses litter-related code issues. The SWD spent \$77,000 on personnel and litter-related code issues in 2015. In addition to the environmental officer, Code Enforcement (Code) responded to 6,900 litter and illegal dumping cases in 2015. This represents approximately 30 percent of the total Code cases. Code estimates that it spent \$150,000 in 2015 personnel costs on litter and illegal dumping cases.

Not In My Town

In 2014, the Mayor's Office led an anti-litter campaign called "Not in My Town," modeled after TxDOT's Don't Mess With Texas campaign. The City spent \$100,000 on billboards, public service announcements on radio and TV, additional funding for the Cash for Trash Program, funding for code enforcement sweeps, a pledge program for customers to tie their garbage bags, and a partnership with the school district ("Not On Our Campus"), where campus cleanliness was promoted and more trash cans were installed.

SAN ANTONIO: THE RIVER CITY

Eighteenth-century Spanish missions line the San Antonio River south of downtown. Upstream, modern urban infrastructure like restaurants, hotels, and businesses stretch along the famed River Walk. The San Antonio River Authority (SARA), an independent river authority responsible for the San Antonio River basin, released a 2014 study¹ on the economic impact of the River Walk that found 11.5 million people visit the River Walk annually. Of these, 9.3 million come from outside Bexar County. These visitors stimulate an overall economic impact of \$3 billion and directly influence 21,000 San Antonio jobs.

ALTERNATIVE REVENUES

Centro San Antonio PID is funded through a property tax on all property owners within the district. In 2015, the PID collected \$3,200,000 in 2015 from a property tax rate of \$0.15 per \$100 of assessed value for commercial property and \$0.09 per \$100 of assessed value for residential property.

As part of residential and commercial monthly solid waste billing, customers pay an environmental services fee of \$2.24. Solid Waste Management Department (SWMD) receives revenue from its residential and commercial solid waste customers to fund its illegal dumping efforts.

Cost Summary

ACTIVITY	LITTER	ILLEGAL DUMPING
Prevention	\$16,500*	\$1,958,400
Education and Outreach	\$255,300	
Abatement	\$2,100,000*	\$2,171,000
Enforcement	\$20,200*	
2015 Litter & Illegal Dumping Costs	\$6,521,400	



San Antonio River Walk

Key Takeaways

- Area governments through the Bexar Regional Watershed Management (BRWM) leverage their resources as a regional group to maintain clean waterways.
- The City's Neighborhood Enforcement Team (NET) is a team of enforcement officers who proactively coordinate code investigations and special projects in highly traveled areas throughout the City's main district corridors and inner city reinvestment areas.

*In some cases, the responding entity did not have complete cost data. An asterisk indicates the entity has a program in place but that the direct cost data was not available for this Study.

¹ <http://media.visitsanantonio.com/News/English/Study-Reveals-River-Walk%E2%80%99s-Importance-to-San-Antonio>

PREVENTION

In an effort to reduce litter and pollutants in runoff, SARA offers project reimbursements of \$15,000 to \$100,000 to incentivize property owners and developers to manage stormwater onsite using Best Management Practices (BMPs). The program is open to design professionals, government entities, neighborhood associations, and non-profits. In 2015, SARA distributed \$13,000 in BMP funding for local projects. SARA also uses a helicopter to identify potential litter accumulation along the river at an annual cost of \$3,500.

The City's SWMD operates four bulky waste collection centers across San Antonio that are free to City residents Tuesday through Saturday. Among the items the City will accept are home appliances, auto parts, tubs, barbecue grills, water heaters, tires without rims, furniture, mattresses, and a cubic yard or less of building materials. This service, which started in 2013, cost the City approximately \$1,958,400 to staff and operate in 2015.

EDUCATION & OUTREACH

In a joint education and outreach campaign by Transportation and Capital Improvements (TCI), 311, Code of Ordinances, and the SWMD, the City runs a "Remember the River" campaign to inform the community about non-point source pollution. The campaign, includes a website, provides construction site stormwater BMPs and proper yard waste disposal instructions. Remember the River also funds an educator who offers free presentations on runoff pollution prevention to San Antonio homeowner and neighborhood associations, civic groups, classes, volunteers or other community groups. Remember the River cost the City \$135,600 in 2015.

Fast Facts

Location: South Texas

Population: 1,469,800

Waterways:

- Alazan Creek
- Apache Creek
- Culebra Creek
- Huebner Creek
- Indian Creek
- Leon Creek
- Lorence Creek
- Martinez Creek
- Medina River Olmos Creek
- Mud Creek
- Panther Springs Rosillo Creek
- Salado Creek
- San Antonio River
- San Pedro Creek
- Sixmile Creek
- Slick Ranch Creek
- Zarzamora Creek
- Victor Braunig Lake
- Mitchell Lake
- Ballasetal Lake
- Elmendorf Lake
- Woodlawn Lake
- Canvasback Lake

Annual Precipitation: 32.3 inches



City of San Antonio and SARA education and outreach campaign logos

SARA offers a comprehensive prevention, education, and outreach program for all watershed stakeholders called Watershed Wise. From 2010-2015, SARA spent an annual average of \$116,700 on anti-litter education and awareness. The following table lists urban programs offered by Watershed Wise:

- **Business:** BMPs for commercial Low Impact Development (LID)
- **Citizen Scientist:** Instructions for crowd-sourcing research-grade watershed data
- **Education:** Curriculum for school-aged children (e.g., Creek Book)
- **Grant:** Funds stormwater runoff capture features on school grounds within Bexar and downstream counties. Three grants cost \$22,000 per year
- **Professionals:** Provides a manual that outlines standard practice for design and implementation of BMPs for LID
- **Rebate:** Reimburses area projects for BMPs between \$15,000 and \$100,000
- **Resident:** BMPs for Residential LID
- **Warriors:** Community volunteers dedicated to protecting and preserving the watershed waterways who regularly participate in waterway cleanups and restoration

Bexar Regional Watershed Management (BRWM)

In response to \$1 billion in flooding damages from two rain events in 1998 and 2002, Bexar County, the City, and SARA formed BRWM in a collaborative effort to provide improved flood control, stormwater management, and water quality in Bexar County. Leveraging the funding resources of the collective organization reduced duplication of effort and facilitated sharing of technical expertise. Representatives from the three member entities meet once a quarter to discuss strategies to combat illegal dumping.

Bexar Regional Watershed Management (BRWM) hosts a two-day training for law enforcement on illegal dumping. One area of focus is providing an understanding of state laws. These training sessions cost \$3,000 per event. Typically, 60 to 70 officers attend the training.

ABATEMENT: LITTER

The City removes litter from the community through the Transportation and Capital Improvements Department (TCI), SARA, and non-profits like Basura Bash.

ORGANIZATION	DESCRIPTION
City of San Antonio - Transportation and Capital Improvement (TCI)	In partnership with Keep San Antonio Beautiful (KSAB), offers "Adopt-a-Spot," where volunteers can clean City-owned rights-of-way, street medians, drainage channels, and green spaces to keep them clear from debris.*
San Antonio River Authority (SARA)	Cleans up 100 tons of litter per year from San Antonio area waterways costing \$400,000 annually in contractors and staff.
Basura Bash	This non-profit arm of the San Antonio River Foundation hosts one of the largest single-day waterway clean-ups in Texas. In 2015, over 2,000 volunteers removed 45 tons of litter from San Antonio waterways. Additionally, 159 tires were collected and almost 2,000 pounds of metal were salvaged for recycling from the event. This annual event cost \$400,000 in direct costs funded through SARA in 2015. While excluded from the cost totals in this Study, volunteers created \$105,500 in volunteer value and Basura Bash received \$26,000 in in-kind donations.

Centro San Antonio

Centro San Antonio is a Public Improvement District (PID), which covers a 0.8-acre area within San Antonio's downtown urban core and watershed. Among other downtown services, the PID provides daily year round maintenance, such as litter pick up, as the City works towards increasing downtown's residential density. In 2015, the PID spent \$1,300,000 on litter abatement.



ABATEMENT: ILLEGAL DUMPING

Landowners along the San Antonio River and its tributaries may contact SARA for a debris removal assessment through the Regional Flood Debris Removal. SARA reports that their debris removal operations, including illegal dumping within San Antonio, result in an annual cost of \$32,000.

The City's Stormwater Utility within TCI responds to customer work orders for debris removal in natural waterways. Through a contractor, TCI spends approximately \$1,500,000 per year on debris removal.

The City's SWMD has a crew of one grapple truck and two 18-wheeler haul trucks dedicated to illegal dumping abatement. In 2015, the crew cleaned up 2,000 tons of illegally dumped material. SWMD estimates that this service cost the City \$639,000 in 2015.

ENFORCEMENT

With dramatic increases in illegal dumping work orders and recovered illegally dumped tires, the City's Code Enforcement Services (Code) created the Neighborhood Enhancement Team (NET). NET is a team of proactive code enforcement officers dedicated to coordinated code investigations and special projects with an emphasis on highly traveled areas throughout the City's main district corridors and inner city reinvestment areas. Code also deploys over 100 officers daily to enforce the code.*

Key Organizations

- City of San Antonio
 - Solid Waste Management Department (SWMD)
 - Transportation and Capital Improvement Projects (TCI)
 - Office of Sustainability
- San Antonio River Authority (SARA)
- Keep San Antonio Beautiful (KSAB)
- Basura Bash

SARA's two environmental investigators work with governmental agencies to help resolve environmental and noncompliance issues within the San Antonio River Basin. In addition to enforcement, the investigators educate the public about how abuse to waterways can cause habitat destruction, degrade aquatic ecology, and alter the beauty of a stream. SARA estimates the environmental investigator program within San Antonio's city limits costs SARA \$13,200 per year. In 2015, SARA was the recipient of a \$7,000 grant to fund installation of surveillance cameras in areas of known illegal dumping.

ACKNOWLEDGMENTS

This Study would not have been possible without the contributions from the nine cities that volunteered their staff's time and financial information. This included contributions from more than 175 people across the cities. A special thank you is extended to Keep Texas Beautiful for their willingness to share data from their 2016 Return on Investment Study. Prior studies on the costs of litter and illegal dumping for the National Resources Defense Council and North Central Texas Council of Governments provided insight for the methodology. Most importantly, leadership and staff from Texans For Clean Water provided the innovation and interest to make this Study a reality.

About Texans For Clean Water

Texans For Clean Water was formally organized in 2013 when Mike Garver of Houston and Trammell Crow of Dallas joined forces to bring the problem of floatable debris in our waterways to state and local officials. The goal of Texans For Clean Water is to organize a statewide group of business leaders through the common initiative of revitalizing our waterways to improve neighborhoods, provide recreational opportunities to our communities, and encourage economic growth. Education and collaboration between the business community and the government are key to developing and adopting best practices to prevent stormwater debris and litter from entering our waterways. Through collaboration we can reach this goal.



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