# **BIG Ideas** for Cleaner Water 2017

Local Government Strategies for Improving Water Quality

## THE HOUSTON-GALVESTON REGION IS EXPECTED TO ADD 3.5 MILLION PEOPLE BY 2040.

## Rapid growth in the Houston-Galveston region will place greater strain on water resources in the future.

Nearly half of the waterbodies in the region are contaminated by bacteria and fail to meet state standards for contact recreation, like wading and swimming. High levels of bacteria can cause illness and infections and can directly impact the local economy.

The good news is, overall, water quality is improving as a result of local and regional bacteria reduction initiatives. One of the most successful of these is the **Bacteria Implementation Group (BIG)**.

In the BIG area, where stakeholders are already coming together to make improvements, there has been great success in reducing bacteria levels.

This document highlights three BIG Ideas local governments can implement to make a difference:

Reduce sanitary sewer system overflows through public awareness, maintenance, and repair.

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Address failing on-site sewage systems through maintenance, repair, and, in some cases, replacement.

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Enhance stormwater management programs for future developments to include water quality elements.

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### HISTORY OF THE BIG

The BIG is a partnership between the Houston-Galveston Area Council (H-GAC), local governments, businesses, and community leaders to develop an Implementation Plan (I-Plan) for reducing bacteria. The project area is a combination of more than 70 water quality projects in adjacent watersheds with common stakeholders working to create a single plan.

The I-Plan offers a menu of water quality protection activities, most of which are voluntary. This I-Plan is the first of its kind in Texas and is successful thanks to the support of numerous involved stakeholders.

Learn more at www.h-gac.com/BIG.



# **BIG Project Area**



## **SANITARY SEWER SYSTEMS**

The network of pipes that collect and transport sewage to wastewater treatment facilities is called a sanitary sewer system. Problems within these systems often lead to overflows, causing untreated sewage to end up in waterbodies.

There were 1,582 reported overflows in the BIG area in 2016. Primary causes include wastewater infrastructure issues, such as line breaks; stormwater infiltration from rain and flooding; and blockages from fats, oils, grease, and wipes.

### RECOMMENDATIONS

- Plan for preventative maintenance and budget for repair and replacement of wastewater infrastructure.
- Conduct infrastructure repairs in conjunction with road projects.
- Share knowledge and resources by participating in continuing education opportunities.
- Participate in the Sanitary Sewer Overflow Initiative, a preventative maintenance program of the Texas Commission on Environmental Quality to help avoid penalties.
- Increase public awareness to reduce blockages by using free materials from regional programs like Cease the Grease, Corral the Grease, and Patty Potty.

"Cleaning pipes is one of the easiest ways to prevent sanitary sewer overflows."

City of Houston Wastewater Operations



## **Causes of Sanitary Sewer Overflows**



Sanitary sewer overflows can be caused by blockages, rainfall infiltration, infrastructure issues, and other factors. These causes can be effectively addressed through education and asset management.



\*Other includes human error, power failures and unknown causes.

Visit www.h-gac.com/BIG and select the **Resources and Information** tab for information, including funding sources and technical assistance.

### CASE STUDY: UNCOVERING FAILING SANITARY SEWER SYSTEMS

### Where

Houston, TX South Houston, TX

#### Who

Bayou Preservation Association City of Bellaire City of Houston City of South Houston

#### Highlights

Identification of Leaking Sanitary Sewers In the summer of 2015, the Bayou Preservation Association (BPA) successfully partnered with the cities of Houston, South Houston, and Bellaire in locating and reporting sanitary sewer overflows.

BPA conducted detailed investigations in Hunting, Brays, Sims, White Oak, and Buffalo bayous. They identified locations with elevated bacteria concentrations and reported them to local jurisdictions.

BPA found that a City of Houston's (COH) temporary sanitary sewer repair from July 2014 was leaking. COH worked with Harris County Flood Control District to correct the leak and implemented a permanent solution by January 2016. BPA also found a hole in an exposed sewer main in South Houston. The City of South Houston worked to replace the line. These agency interactions to find and repair the collection system prevent unwanted sewage from entering surrounding water bodies.

## **ON-SITE SEWAGE SYSTEMS**

On-site sewage systems, including septic systems, treat wastewater on property instead of at a wastewater treatment facility. Failing systems are one of the most widespread bacteria sources in the region.

There are an estimated 44,914 permitted on-site sewage systems in the BIG region, with many more installed before permit requirements were put in place in 1989. Older and improperly maintained systems are prone to failure, though all systems require regular care and maintenance.

### RECOMMENDATIONS

- Cross train and license employees to conduct investigations and enforce regulations.
- Educate homeowners and real estate professionals through training courses and workshops.
- Require regular maintenance and inspection of on-site sewage systems.
- Prioritize and replace failing systems or connect property owners to sanitary sewer systems using local, state, or federal funding programs.

### CASE STUDY: STREAMLINING ON-SITE SEWAGE SYSTEM INSPECTIONS

Where Walker County, TX

Who Walker County Private-Sector Inspectors

Highlights Public-Private Partnership Reduction in Administrative Burden Walker County requires the owners of certain on-site-sewage systems to submit maintenance and inspection reports, including a processing fee. To streamline the process, almost all inspections are now conducted by licensed providers who submit the reports and fees. This greatly reduces the County's administrative burden.

The County uses the reports to ensure maintenance is regularly performed. The fees help support administrative costs. To ensure quality service, county staff inspect approximately 5% of the on-site sewage systems in their jurisdiction each year.

The program represents a successful private industry-government partnership and is a model for county enforcement of on-site sewage systems.

## **On-Site Sewage System Information System**



An interactive database of permitted on-site sewage systems in the region helps decision-makers better understand where problem areas may exist and prioritize areas for future improvements.

Visit www.h-gac.com/go/wrim and click on the "Advance Tab" and open the "OSSF layers" to use this tool.

Visit www.h-gac.com/BIG and select the **Resources and Information** tab for information, including funding sources and technical assistance.

## **STORMWATER MANAGEMENT**

By 2040, the region is expected to add approximately 500 square miles of developed area, including 6 million square feet of parking spaces and 4.3 billion square feet of development.

Unlike sewage, stormwater is not treated before it enters waterways. Low Impact Development (LID) is a type of water quality infrastructure that mimics natural drainage patterns to slow stormwater and has the potential to reduce polluants entering waterbodies.

### RECOMMENDATIONS

- Use low impact development (LID), where appropriate, as an alternative to traditional stormwater features.
- Revise existing ordinances or regulations to provide flexibiliy in the use of LID.
- Install pet waste stations and develop programs that encourage people to pick up after their dogs.
- Develop detention areas that include not only flood management functions but also water quality features, such as wetlands or enhanced riparian buffers.

## CASE STUDY: BACTERIA REDUCTION THROUGH LOW IMPACT DEVELOP-

### Where

Jersey Village, TX

### Who

City of Jersey Village Harris County Flood Control District

#### **Highlights** Flood Mitigation Water Quality Improvement

In response to widespread flooding, the City of Jersey Village purchased the Jersey Meadow golf course in 2008 to improve stormwater management and water quality in the area.

In partnership with Harris County Flood Control District, the City converted nine holes into a 42-acre detention basin which holds 114 million gallons of stormwater. It is one of five detention basins built with water quality features along White Oak Bayou.

This effort, along with other initiatives, has helped reduce bacteria concentrations in White Oak Bayou by 75% since 2007. However, most of the bayou still doesn't meet state standards for bacteria.

## Low Impact Development Mapping Tool



## **Designing for Impact**

Designing for Impact is a mapping application that highlights various Low Impact Development (LID) projects across H-GAC's 13 county region. Click the sites on the map to see a project's location, photos, features and benefits. Projects are grouped based on development type:

- Residential Development Projects (10 projects)
- <u>Non-Residential Development Projects (24</u> projects)
- Mixed Use Development Projects (1 project)

H-GAC's Designing for Impact mapping tool is a clearinghouse with data on 59 projects across the region using LID to improve water quality.

Visit www.h-gac.com/go/LID to access this tool or submit projects to help H-GAC expand this list.

Visit www.h-gac.com/BIG and select the **Resources and Information** tab for information, including funding sources and technical assistance.



H-GAC forecasts an additional 500 square miles of development in the region—the equivalent of an area approximately the size of Los Angeles.

## **MORE I-PLAN STRATEGIES**

## In addition to the BIG ideas highlighted in this document, the BIG I-Plan includes strategies in eight additional topic areas:

### **Wastewater Treatment Facilities**

- Strengthen monitoring requirements
- Retrofit facilities not meeting current performance standards
- Improve design and operation criteria for new plants
- Encourage combining historically non-compliant facilities with nearby facilities
- Allow unannounced inspections to increase enforcement

#### Research

- Evaluate the effectiveness of implementation strategies
- Secure funding for additional research projects

### Construction

 Increase compliance and enforcement of stormwater management permits

### **Illicit Discharges and Dumping Sources**

- Better control of waste hauler activities
- Monitor efforts to detect, map, and eliminate illicit discharges

#### **Geographic Priority Framework**

- Host meetings throughout the region for local stakeholder feedback
- Prioritize watersheds to best address impairments through implementation

### **Monitoring and I-Plan Revision**

- Continue routine water quality monitoring and analysis
- Strengthen implementation tracking to develop adaptive watershed management planning
- Propose changes to the I-Plan based on monitoring results

### **Agriculture and Animal Sources**

 Expand existing programs, such as erosion control, nutrient reduction, and livestock management

### **Residential Sources**

 Provide public education on proper disposal of fats, oils, grease, and pet waste



### Reducing bacteria in the region's waterbodies is going to take coordination, collaboration, and leadership from local governments, organizations, and residents.

There are many recommendations and activities already underway to improve water quality as detailed in the BIG I-Plan and annual progress reports, available at **www.h-gac.com/BIG**.

## **Be a Part of the Solution!**

Help build on the work of the BIG by participating in meetings and workshops, implementing I-Plan recommendations pertinent to your jurisdiction and sharing your success stories.

Be a part of the conversation and share your successes at **www.h-gac.com/BIG** and click on the Resources and Information tab.







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