



# LUCHA

LAND USE COLONIA  
HOUSING ACTION  
AN INITIATIVE OF LUPE AND ARISE



## Educational Library

Governance

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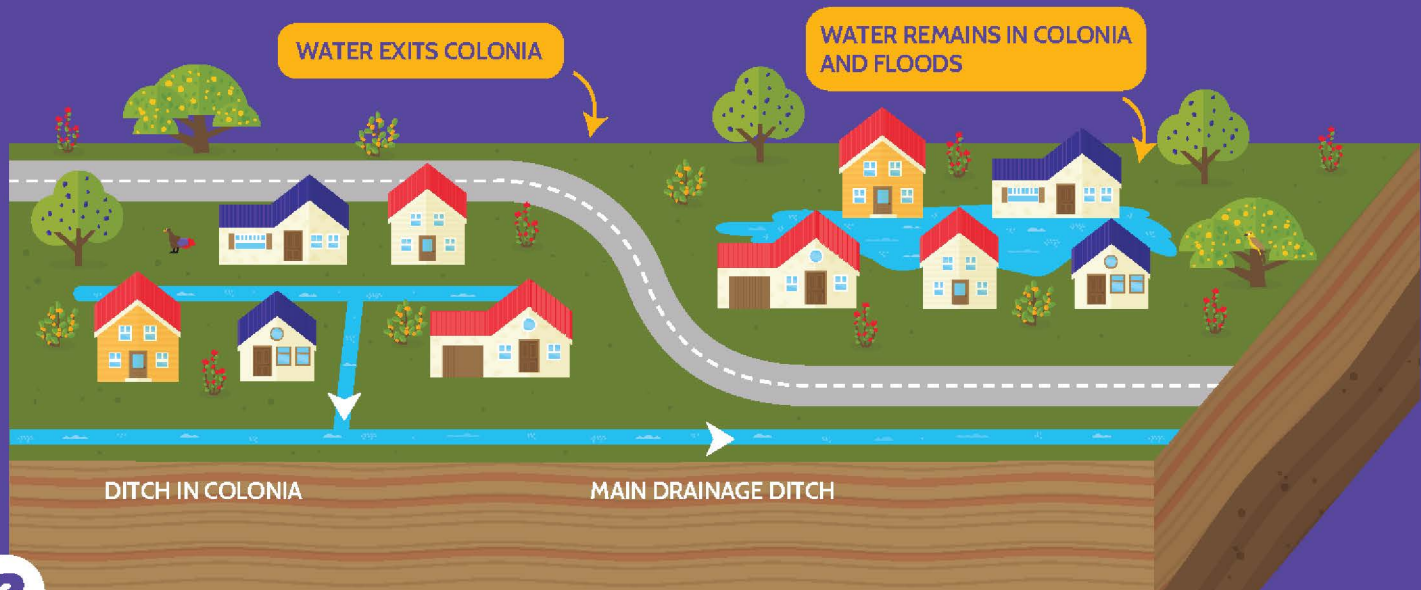
# Why Is Understanding Drainage Infrastructure Important To Me?

**Drainage infrastructure varies in size, scale and purpose, yet it is meant to work together to keep our home, businesses, and communities safe. Understanding how it works and where it might not be working is important to keeping your community safe.**

- ▶ As new drainage projects and funding come up in your community, it is important for your input to be heard. Understanding the types of infrastructure, their purpose, and who controls it will help you feel more prepared.
- ▶ Your home and property is a part of the regional drainage system, and there are things you can do to lessen the effects of regular flooding.
- ▶ Knowing who plans, builds, and maintains infrastructure helps your community advocate for your drainage needs.

## How Does Our Drainage Infrastructure Work?

- ▶ Water can be drained through natural and artificial means. This means that when it rains, some water naturally seeps into the ground, and the rest is either collected or carried away through a network of drainage infrastructure - moving the water through neighborhoods into rivers, creeks, resacas, lakes and eventually into either the Lower Laguna Madre or the Gulf of Mexico.
- ▶ Drainage infrastructure is a key part of stormwater management, which you learned about in level 2. Current drainage infrastructure ranges from small scale neighborhood drainage ditches, to large scale dams, floodways, and levees. This system is meant to work together to support the varying water needs of the region.



# Scale Of Infrastructure

## Part 1

### Regional

Regional scale drainage infrastructure typically includes planning and funding for regional large scale drainage infrastructure, addressing the needs of multiple counties and municipalities. This scale of infrastructure is key to handling the increased need for capacity during large rains and storms. It also plays a key role in areas that are developing rapidly. Typical regional drainage infrastructure includes large stormwater drains, detention basins, floodways, dams, and other large scale water.

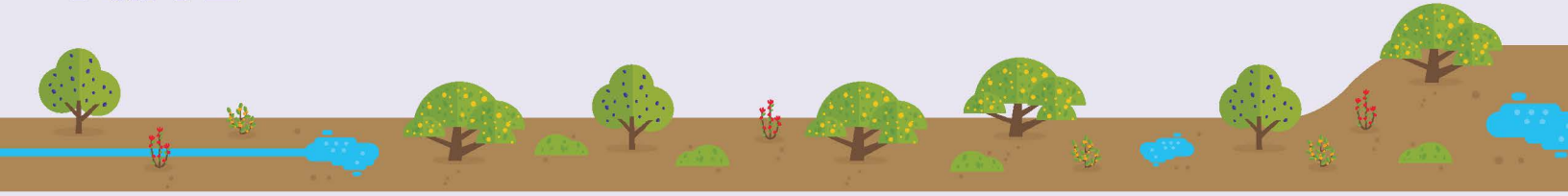
### Municipal Drainage System

Municipal drainage systems are designed to manage the drainage needs of a municipality. The size and complexity of these types of systems depend greatly on the size and wealth of the municipality. Common types of municipal drainage infrastructure include storm drains, piped drainage infrastructure, small rivers & creeks, and water reservoirs.



# Scale Of Infrastructure

## Part 2



### Neighborhood Drainage Infrastructure

- ▶ Neighborhood drainage infrastructure and municipal drainage infrastructure can look very similar.
- ▶ In areas like the county, where the infrastructure standards are lower, the most common form of neighborhood drainage infrastructure are drainage ditches.
- ▶ These ditches, often lining the back of a residential property, connect to other properties in the neighborhood to collect the runoff from each property.



Private lot drainage infrastructure is the smallest scale, but can make a significant impact when a majority of lot owners in an area have properly maintained, effective water collection, holding, and conveying infrastructure.

### Private Lot

- ▶ The ditches lining a property owner's backyard is often thought of as neighborhood scale infrastructure. However, typically each property owner owns, and is responsible for the maintenance of that ditch.
- ▶ While it may not look like it, these ditches are a critical part of the drainage system. Keeping them clear of debris, not filling them in with dirt, and retrenching from time to time is part of preventing your lot and your neighbor's lot from flooding.
- ▶ Other private lot infrastructure includes retention infrastructure like rain gardens, vegetated swales, and rain barrels.



# Types Of Public Drainage Infrastructure



## Infrastructure That Conveys



**DITCHES** A drainage ditch is a small to moderate trench created to collect and carry water for the purpose of drainage. Ditches are used to drain water from low lying areas, channel water for plant irrigation, and/or carry water to larger drainage infrastructure. Drainage ditches are often located along roadways or fields, and along the border of private property.



**DRAIN** A drain is a channel or pipe that receives excess stormwater and carries it to rivers, waterways, or another piped system.



**FLOODWAY** A floodway can be the channel of a river, creek, or other waterway, and the lands adjacent to those waterways. The floodway carries the bulk of water during large rains or storms downstream, and typically moves the water faster than other drainage infrastructure. Because of its importance, floodways are regulated to make sure any development within them would not reduce their ability to move or hold water. During very large rains or storms, land next to a river or waterway may be allowed to flood as a part of the system.

## Infrastructure That Connects



**OUTFALL OR OUTLET** An outlet is the connecting point between different drainage systems or infrastructure. The place where water from smaller drainage collection infrastructure releases water into larger drainage infrastructure. Some colonies are not connected to larger regional systems through outfalls, and this results in flooding during large rain events.



**STORM DRAIN OR INLET** A storm drain or inlet allows excess rain and stormwater to drain from impervious surfaces such as paved streets, parking lots, footpaths, sidewalks, and roofs to underground pipes or ditches which then move the water to areas where it can be retained. The design of a storm drain or inlet can vary, and can be used in smaller residential infrastructure as well as large municipal systems. Many storm drain systems are designed to carry stormwater, untreated, into rivers or streams.



**SPILLWAY** A spillway, also known as an 'overflow channel' is a structure that provides the safe release of flood waters from a dam to a downstream area (normally the river on which the dam is situated). As every water reservoir has a certain capacity; spillways are utilized to ensure that the water does not overtop, damage or even destroy the dam during flood periods.

## Infrastructure That Blocks



**DAMS** A dam is used to control water; to make sure the right amount of water is at the right place at the right time. River water rises behind dams, forming artificial lakes called reservoirs. The stored water can be used to generate electricity, supply water for homes and industries, for irrigation, or for navigation.



**LEVEES** A levee is a natural or artificial wall, often made of earth, that blocks water from going where we don't want it to go. They prevent rivers from flooding cities during large rain events or from a storm surge. Levees may be used to increase available developable land, or divert a body of water so the area may be used for agriculture.



**GATES** Gates or floodgates are solid metal barriers in a dam that can be opened to release flood waters downstream.

# Who Is In Charge Of Drainage Infrastructure?

## Part 1

### Local Authorities

► **IRRIGATION DISTRICT:** Irrigation districts have a long history in Texas, and are numerous in the Valley. Their primary responsibility is providing an adequate, reliable source of water for irrigation, municipal, industrial and domestic purposes within the district. While their primary role is to support agricultural, residential, and commercial activities, due to the urbanization of the region their infrastructure is increasing being used to drain water during large rain events, or collect and carry stormwater to area treatment plants to supply local used clean water.

Irrigation districts are limited purpose districts that are governed by chapter 59 of the state Water Code. The governing body of a district is the board of directors, made up of five directors who are elected by voters in their district. Districts have the authority to construct necessary improvements, including bridges and culverts; purchase machinery and supplies; make rules related to water service, assessments, and payment; and enter into contracts. The board of directors also have the ability to issue bonds, or borrow funds to meet the obligations of the district. Bonds must be approved by voters.

► **DRAINAGE DISTRICT:** Drainage Districts are special districts (single purpose governmental unit), created for the purpose of constructing, maintaining, and managing local drainage systems. They are a resource in achieving both local and often regional drainage needs, and reduce the risk of catastrophic flooding events. This may include the development of flood reduction plans, and implementing and constructing new facilities such as canals, drains, ditches, and levees.

The creation of drainage districts, as a unit of government, was authorized by the Texas legislature in 1905. Each district requires the approval of two thirds of voter who live in the proposed district. The governing boards for a district includes three commissioners and a civil engineer who are either appointed by the county commissioners' court, or under certain conditions the commissioners may be elected. Alternatively, the duties, powers, and rights of a board can be transferred to the commissioners court of the county in which the district is entirely located. An example of this is Hidalgo County Drainage District.

► **COUNTY PLANNING DEPARTMENT:** The planning departments play a role in making sure new residential subdivisions and commercial development have adequate drainage infrastructure. Before a new subdivision is platted, or a new commercial development built, the plans must be approved by the county planning department. It is critical that new projects are built with enough drainage infrastructure to capture, move, or hold the runoff created by the new development.

► **MUNICIPAL STORMWATER & PLANNING DEPARTMENTS:** Each municipality handles stormwater management a little differently. Home rule cities have a greater ability to create ordinances, establish fees, and dedicate staff and money to addressing local stormwater concerns. Additionally, similar to county planning departments, municipal planning departments review and approve new development plans.

► **INTERNATIONAL BOUNDARY & WATER COMMISSION:** The International Boundary and Water Commission is a binational commission, established to implement United States and Mexican boundary and water treaties and agreements. The IBWC consists of two section (U.S & Mexico), each of which is administered independently, and headed by an Engineer Commissioner selected by their President.

# LUCHA Educational Library

## “Drainage Infrastructure Systems & Scales”



### Spanish Palms; A Flooding Story

Spanish Palms regularly flooded; a hard rain would cover the colonia's streets, backyards, and many of the houses with water. During storms like Hurricane Dolly, the water level would get up to 2 feet deep - resulting in stranded residents, and extensive damage to their property.

The colonia faced two key issues when it came to dealing with water. First, the internal infrastructure was a mix of functional and nonfunctional ditches, and second, FM 1015 was keeping water from flowing out of the neighborhood. Local authorities proposed building a connection (outfall) from the colonia to a larger drainage ditch, which felt like a big step in addressing Spanish Palms' drainage problems. However, after several meetings with the community, residents shared that the water within the colonia wasn't flowing towards, or pooling near the proposed new outfall.

With the help of a local designer, a new design was produced. The new plan proposed improving the drainage ditches within the colonia so that water could flow to a newly created drain along FM 1015. The community used the designs to advocate for the alternative infrastructure plan, and ultimately address their flooding issues. This is an example of how the best solution comes when it includes both local knowledge, and the connection of local and regional scale stormwater infrastructure.



## Who Is In Charge Of Drainage Infrastructure? Part 2

### Policy Agencies

- ▶ **TEXAS WATER DEVELOPMENT BOARD** The Texas Water Development Board is state agency whose “mission is to provide leadership, information, education, and support for planning, financial assistance, and outreach for the conservation and responsible development of water for Texas.” TWDB is not a regulatory agency, which means it doesn't make or enforce any regulations, statutes, or laws. Instead they use their resources for water planning, data collection and sharing, and financial and technical assistance for local jurisdictions and communities. TWDB's financial assistance programs are funded through state backed bonds, a mix of state bond proceeds and federal grant funds, or limited appropriated funds.
- ▶ **TEXAS COMMISSION ON ENVIRONMENTAL QUALITY** The Texas Commission on Environmental Quality is the state's environmental agency. It is tasked with enforcing clean air, water and waste management laws, and issues air and water operating permits. TCEQ “strives to protect our state's public health and natural resources consistent with sustainable economic development. Our goal is clean air, clean water, and the safe management of waste.” Texas and the TCEQ have not always complied with federal environmental standards set by the federal Environmental Protection Agency (EPA), which has led to friction and several lawsuits between the two agencies.
- ▶ **GENERAL LAND OFFICE** The General Land Office is a state agency that manages state lands, helps fund Texas public education through the Permanent School Fund, oversees and administers funds for disaster recovery in Texas, operates the Alamo, provides benefits to Texas Veterans, and manages the Texas coast. The head of the General Land Office is the Texas Land Commissioner, this position is elected through a statewide vote every four years.



## The LUCHA Library

The Land Use Colonia Housing Action [LUCHA] initiative is a partnership of organizations and organized colonia residents to build leadership capacity, expand technical knowledge, change land use and development policy, and build relationships between colonia residents and local, state and federal authorities. The goal of the LUCHA initiative is to build power by supporting community organizing efforts, inform colonia leaders on key issues, and provide opportunities for engaged conversations with regional experts.

The LUCHA Library is part of the larger LUCHA initiative. The Library is a collection of community education resources that seeks to provide Rio Grande Valley residents with easy to understand technical information around key community issues. Developed with the members of LUPE and ARISE, the LUCHA Library is designed to support community organizing efforts in the region by empowering residents with information.

